



# COMMONWEALTH of VIRGINIA

## DEPARTMENT OF ENVIRONMENTAL QUALITY

PIEDMONT REGIONAL OFFICE

4949-A Cox Road, Glen Allen, Virginia 23060

(804) 527-5020 Fax (804) 527-5106

[www.deq.virginia.gov](http://www.deq.virginia.gov)

Preston Bryant  
Secretary of Natural Resources

David K. Paylor  
Director

June 2, 2009

Mr. Rod Parker  
Northern Neck Farmers Market  
1647 Kings Highway  
Colonial Beach, Va. 22520

**CERTIFIED MAIL  
RETURN RECEIPT REQUESTED**

RE: VPA Permit Reissuance VPA01422  
Northern Neck Farmers Market – Westmoreland County

Dear Mr. Parker:

Your Virginia Pollution Abatement (VPA) permit is enclosed. This permit supersedes the previous VPA Permit No. VPA01422 issued to this facility. Report forms are included with the permit. Please make additional copies of the forms for future use. The first monitoring report for monthly parameters is due August 10 for the period of July 2009. The first monitoring report for quarterly parameters is due October 10 for the period of July through September 2009, and the first yearly report is due January 10, 2010. If you still have monitoring data to report as required by the previous permit, please submit it as an attachment to the first monitoring report required by this permit.

Please send monitoring reports to:

Virginia DEQ, Piedmont Regional Office  
4949-A Cox Road  
Glen Allen, Virginia 23060

As provided by Rule 2A:2 of the Supreme Court of Virginia, you have thirty days from the date of service (the date you actually received this decision or the date it was mailed to you, whichever occurred first) within which to appeal this decision by filing a notice of appeal in accordance with the

Rules of the Supreme Court of Virginia with the Director, Department of Environmental Quality. In the event that this decision is served on you by mail, three days are added to that period.

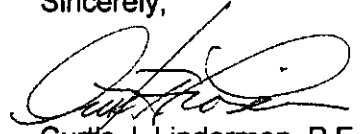
Alternatively, any owner under § 62.1-44.16, 62.1-44.17 and 62.1-44.19 of the State Water Control Law aggrieved by any action of the State Water Control Board taken without a formal hearing, or by inaction of the Board, may demand in writing a formal hearing of such owner's grievance, provided a petition requesting such hearing is filed with the Board. Said petition must meet the requirements set forth in 9 VAC 25-230-130.B. In cases involving actions of the Board,

Permit No. VPA01422  
Northern Neck Farmer's Market  
Page 2

such petition must be filed within thirty days after notice of such action is mailed to such owner by certified mail.

If you have any questions about the permit, please contact Denise Mosca at (804) 527-5027 or [Denise.Mosca@deq.virginia.gov](mailto:Denise.Mosca@deq.virginia.gov).

Sincerely,



Curtis J. Linderman, P.E.  
Water Permits Manager

Enclosure:                      Memorandum  
   Permit No. VPA01422

cc:      OWPS



COMMONWEALTH of VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL QUALITY

Permit No. VPA01422  
Effective Date: June 2, 2009  
Expiration Date: June 1, 2019

AUTHORIZATION TO MANAGE POLLUTANTS UNDER THE  
VIRGINIA POLLUTION ABATEMENT PERMIT  
AND  
THE VIRGINIA STATE WATER CONTROL LAW

In compliance with the provisions of the State Water Control Law and the Permit Regulation adopted pursuant thereto, the following owner is authorized to manage pollutants in conformity with the application, plans, specifications and supporting data submitted to the Department of Environmental Quality and other conditions set forth in this permit.

OWNER: Northern Neck Vegetable Growers Association  
OWNER ADDRESS: 3421 Horners Mill Rd.  
Montross, Virginia 22520  
FACILITY NAME: Northern Neck Farmers Market

The authorized pollutant management shall be in accordance with this cover page, Part I - Monitoring Requirements and Special Conditions and Part II - Conditions Applicable to All VPA Permits, as set forth herein.

  
Water Permit Manager, Piedmont Regional Office

6/2/09  
Date

## A. MONITORING REQUIREMENTS

1. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmers Market and the land application site located at the south west end of the Northern Neck Farmers Market property, east of the stormwater pond.

- a. The pollutants shall be monitored by the permittee as specified below:

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>WASTEWATER MONITORING</u>		<u>MONITORING REQUIREMENTS</u>	
		<u>UNITS</u>	<u>Frequency</u>	<u>Sample Type</u>	
Flow (MG)	NL	MG	Monthly	Estimate	
Application Rate (Instantaneous Max.)	0.25	in/hr	Monthly	Calculate	
Application Rate (Instantaneous Max.)	1.0	in/day	Monthly	Calculate	
Application Rate (Instantaneous Max.)	2.0	in/wk	Monthly	Calculate	
pH	NL	Standard Units	1/Year	Grab	
Total Kjeldahl Nitrogen (TKN)	NL	mg/l	1/Year	Composite*	
Nitrate-Nitrite-Nitrogen (NOx)	NL	mg/l	1/Year	Composite	
Effluent PAN**	NL	mg/l	1/Year	Calculate	
Total Sodium	NL	mg/l	1/Year	Composite	
Total Chloride	NL	mg/l	1/Year	Composite	
Pounce	NL	ug/l	1/Year	Composite	
Metaxly (Ridomil/Copper)	NL	ug/l	1/Year	Composite	
Chlorothalomil (Bravo)	NL	ug/l	1/Year	Composite	
Total Recoverable Copper	NL	ug/l	1/Year	Composite	
Total Recoverable Manganese	NL	ug/l	1/Year	Composite	

NL = No Limit, this is a monitoring requirement only

- b. Samples taken in compliance with the monitoring requirements specified above shall be taken in July each year (see Part I.B.3) at the following locations: Wastewater samples to be taken in accordance with the locations and procedures outlined in the approved O&M Manual (see Part I.B.8).

- \* A representative composite sample shall be comprised of at least four volume average or weight average grab samples composited over a daily operating period.
- \*\* Plant Available Nitrogen. This consists of the addition of the nitrogen parameters of TKN and Nitrate-nitrite divided by 0.9.

A. MONITORING REQUIREMENTS

2. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmers Market and the land application site located at the south west end of the Northern Neck Farmers Market property, east of the stormwater pond.

- a. The pollutants shall be monitored by the permittee as specified below:

SOILS MONITORING

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>UNITS</u>	<u>MONITORING REQUIREMENTS</u>	
			<u>Frequency</u>	<u>Sample Type</u>
pH	NL	Standard Units	1/Year	Composite
Cation Exchange Capacity	NL	Meq/100g	1/Year	Composite
Available Phosphorus	NL	mg/kg	1/Year	Composite
Exchangeable Potassium	NL	mg/kg	1/Year	Composite
Hydraulic Conductivity	NL	in/hr	1/Year	Composite or in situ

NL = No Limit, this is a monitoring requirement only

- b. Samples taken in compliance with the monitoring requirements specified above shall be taken in October of each year (see Part I.B.3) at the following locations: soil samples to be taken in accordance with the locations and procedures outlined in the approved O&M Manual (see Part I.B.8).
- c. Soil composite samples shall be representative of the soil types delineated by the SCS Soil Survey (or the equivalent). Samples shall be taken at 0-6 inches soil depth for each application site.

**A. MONITORING REQUIREMENTS**

3. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmers Market and the land application site located at the south west end of the Northern Neck Farmers Market property, east of the stormwater pond.

- a. The pollutants shall be monitored by the permittee as specified below:

**GROUNDWATER MONITORING**

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>UNITS</u>	<u>MONITORING REQUIREMENTS</u>	
			<u>Frequency *</u>	<u>Sample Type</u>
Static Water Level	NL	ft	Quarterly	Measure
Chloride	NL	mg/l	Quarterly	Grab
Total Kjeldahl Nitrogen	NL	mg/l	Quarterly	Grab
Nitrate-Nitrite Nitrogen	NL	mg/l	Quarterly	Grab
Total Organic Carbon	NL	mg/l	Quarterly	Grab
pH	NL	Standard Units	Quarterly	Grab
Sulfate	NL	mg/l	Quarterly	Grab
Total Dissolved Solids	NL	mg/l	Quarterly	Grab

NL = No Limit, this is a monitoring requirement only

\* See Part I.B.16.c.

- b. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Groundwater Monitoring Well Numbers MW-1, MW-2, and MW-3. (Refer to Attachment A).
- c. The wells shall be properly purged prior to sampling each monitoring well.
- d. Samples shall be submitted no later than: April 10 for sampling during the first quarter of January through March, July 10 for the second quarter April through June, October 10 for the third quarter July through September, and January 10 for the fourth quarter October through December (see Part I.B.3).

**B. Other Requirements and Special Conditions**

1. Wastewater shall be applied only at the site identified in Part I.A.
2. For all land treatment of wastewater, the following shall be required:
  - a. There shall be no application of wastewater to the ground when it is saturated, frozen or covered with ice or snow, and during periods of rainfall.
  - b. The chosen method of wastewater application shall minimize human contact with the wastewater.
  - c. Wastewater shall be prevented from coming into contact with drinking fountains, water coolers, or eating surfaces.
  - d. Application or irrigation systems used for land treatment of wastewater shall be designed, installed and adjusted to:
    - (1). Provide uniform distribution of wastewater over the land treatment site,
    - (2). Prevent ponding or pooling of wastewater at the land treatment site,
    - (3). Facilitate maintenance and harvesting of the land treatment site and to prevent damage to the application or irrigation system from the use of maintenance or harvesting equipment,
    - (4). Prevent aerosol carry-over from the land treatment site to areas beyond the setback distances described in Part I.B.9., and
    - (5). Prevent clogging from algae or suspended solids.
  - e. Any wastewater runoff shall be confined to the land application site.
3. A summary report covering the previous month's activities shall be submitted to DEQ-Piedmont Regional Office by the 10th of each month. The report shall include the following components: cover page Attachment B.1 and the following monitoring pages:
  - a. Analyses of composite samples of industrial wastewater land applied annually shall be reported on the monitoring report provided in Attachment B.3.b.
  - b. Results of annual soils, and biannual groundwater monitoring in accordance with Part I.A. of the permit reported on the monitoring report provided in Attachment B.4. and B.5.
  - c. Land application site information describing the wastewater applied to each field during the previous month reported on the monitoring report provided in Attachment B.3.a.
  - d. A summary of the quantities of wastewater stored in or withdrawn from storage facilities and the remaining storage capacity (Attachment B.2).

During months when wastewater sampling (B.3.a), soils and ground water monitoring (B.3.b), or land application of wastewater (B.3.c) does not occur, the monthly summary report should clearly state and certify "No activity" on the cover Attachment B reporting form.

4. An annual summary report shall be submitted to DEQ-Piedmont Regional Office by February 10th of each year, to cover activities of the previous calendar year. The report shall include:
  - a. A summary of the monitoring data results including wastewater analysis, soil monitoring, and ground water monitoring.

- b. The yearly wastewater balance showing such items as inputs/drawdowns from storage facilities, and the available capacity remaining in the storage facilities.
- c. Land application site information describing the wastewater applied to each field during the previous year with the annual and cumulative loading constituents and the remaining site life for each field.
- d. A summary of the agronomic practices which occurred during the preceding growing season including but not limited to the timing and number of crop cuttings, and an estimate of total crop yield (bushels/acre or tons/acre) removed from the site, any lime, nitrogen and fertilizer additions made to the site (describe type and quantities), and reseeded.
- e. A general statement of past system performance and the status of the permitted facilities with regard to complying with Virginia Pollution Abatement Permit requirements.

**Annual Summary Reports Due: No later than February 10, 2010 through 2019.**

- 5. **Stormwater Discharge Exception.** All pollutant management activities covered under this permit shall maintain no point source discharge of pollutants to surface waters except in the case of a storm event greater than the 25-year, 24-hour storm. The operation of the facilities of the owner permitted herein shall not contravene the Water Quality Standards, as amended and adopted by the Board, or any provision of the Water Control Law.
- 6. **Materials Handling/Storage.** Any and all product, materials, industrial wastes, and/or other wastes resulting from the purchase, sale, mining, extraction, transport, preparation, and/or storage of raw or intermediate materials, final product, by-product or wastes, shall be handled, disposed of, and/or stored in such a manner so as not to permit a discharge of such product, materials, industrial wastes, and/or other wastes to State waters, except as expressly authorized.
- 7. **Freeboard.** All waste storage facilities shall maintain one foot of freeboard at all times, up to and including a 25-year, 24-hour storm.
- 8. **Operations and Maintenance Manual (O&M).** The permittee shall review the existing Operations and Maintenance (O&M) Manual and notify the DEQ regional office within 90 days of the effective date of this permit, in writing, whether it is still accurate and complete. If the O&M manual is no longer accurate and complete, a revised O&M Manual shall be submitted for approval within 90 days of the effective date of this permit. The permittee shall maintain an accurate, approved O&M Manual for the treatment works/pollutant management system permitted herein. This manual shall reflect the practices and procedures, including applicable Best Management Practices (BMPs), followed by the permittee to ensure compliance with the requirements of this permit. The permittee shall operate the treatment works in compliance with the approved O&M manual. This manual shall include, but not necessarily be limited to, the following items, as appropriate:
  - a. Techniques to be employed in the collection, preservation, and analysis of effluent samples;
  - b. Procedures for measuring and recording the duration and volume of treated wastewater to be land applied;
  - c. Procedures for handling, storing, and disposing of all wastes, fluids and pollutants characterized in Part I.B.6 that will prevent these materials from reaching state waters; and
  - d. Treatment works/pollutant management system design, treatment works operation, routing preventative maintenance of units within the treatment works/pollutant management system, critical spare parts inventory and record keeping; and
  - e. A sludge/solids disposal plan; and
  - f. A plan to maintain cation balance.

Any changes in the practices and procedures followed by the permittee shall be documented and submitted for staff approval within 90 days of the effective date of the changes. Upon approval of the submitted manual changes, the revised manual becomes an enforceable part of the permit.

9. Buffer zones. Buffer zones shall be maintained as follows:

	<u>Ft. (Minimum)</u>
a. Distance from public recreation areas:	200 feet
b. Distance from drinking water reservoir/wells or springs:	200 feet
c. Distance from all property lines:	100 feet*
d. Distance from all surface water courses/dry ditches:	100 feet*
e. Distance from all public roads:	100 feet
f. Distance from sinkholes and Rock outcrops:	50 feet
g. Distance from power poles:	25 feet

\* Vegetated buffer zones (minimum 60% soil coverage) required.

10. Wind Restriction. Land Application of waste waters or highly liquid sludges shall not occur during winds of sufficient strength to cause overspray or drifting of aerosols into or beyond the buffer zones.

11. A Facilities Closure Plan shall be developed prior to termination of the pollutant management activities covered under this permit. The plan shall incorporate:

- The volume, percent solids, nutrient content, and other waste characterization information appropriate to the nature of the waste materials.
- A listing of all waste products at the facility along with a description of procedures for removal, or other proper disposal of the wastes.
- Closure plans for all waste treatment, storage, and handling facilities and appropriate groundwater monitoring wells.

The Facilities Closure Plan shall be submitted to the Department of Environmental Quality – Piedmont Regional Office for review and approval prior to implementation of the plan.

12. The permittee shall cease production operations resulting in wastewater generation should all holding capacity (excluding minimum freeboard) be used and inclement weather and/or maximum application rate or vegetative cover requirements preclude wastewater land application.

The permittee shall notify the DEQ Piedmont Regional Office, as an attachment to the monthly summary report prepared in accordance with Part I.B.3, when production operations cease due to inadequate holding capacity. The notification shall include the date and length of time that operations ceased, and steps taken by the permittee to reduce, eliminate and prevent a recurrence of inadequate holding capacity. If at any time DEQ should determine that additional permanent wastewater storage

is needed, no later than 60 days following the date of DEQ notification, the permittee shall submit plans and a schedule for constructing additional storage of wastewater. Upon approval by DEQ, the plan and schedule shall become an enforceable provision of this permit."

13. The permittee shall notify DEQ – Piedmont Regional Office immediately of any change in pesticide usage such that the pesticides identified in the application as "most toxic used" and "most used" change. The PRO may require wastewater monitoring for the reported changes.
14. The application of wastewater together with any other source of Plant Available Nitrogen (PAN) shall not exceed the agronomic loading rate for the crops in the field being land applied. This agronomic loading rate shall not exceed the PAN loading rate of 120 pounds per acre per year, which is appropriate for an irrigated crop of Fescue/Orchardgrass and the field productivity class of III. The application rates shall be calculated for each field based upon the PAN assimilative capacity. PAN calculations should be made using the results from at least the last calendar year of wastewater sampling which is expected to provide 6 months of wastewater sampling (from June to November). The resulting application rates shall be included in the yearly reports sent to the Department. Appropriate records shall be maintained by the permittee for the site regarding nitrogen loadings from manure, chemical fertilizers, wastewater and any other nitrogen additions applied to the site.
15. The owner shall establish and maintain a complete and healthy vegetative cover. Effluent shall be applied only at the land application site located at the south west end of the Northern Neck Farmers Market property, east of the stormwater pond when a complete and healthy vegetative cover is established.
16. Ground Water Monitoring
  - a. Within 60 days of the effective date of this permit, the permittee shall submit to the DEQ Piedmont Regional Office an approvable plan and schedule for addressing the upward trends, compared to the up-gradient well, in Total Dissolved Solids concentrations at groundwater monitoring well MW-2, and nitrate-nitrogen concentrations at groundwater monitoring well MW-3. Once approved by DEQ, the plan and schedule shall become an enforceable part of the permit. Any changes to the plan must be submitted for DEQ approval.
  - b. If monitoring results indicate that any unit has contaminated the ground water, the permittee shall submit to the DEQ Piedmont Regional Office an approvable plan and schedule for corrective action no later than 60 days following the date of DEQ notification. The plan shall set forth the steps to be taken by the permittee to ensure the contamination source is eliminated or that the contaminant plume is contained on the permittee's property. In addition, based on the extent of contamination, a risk analysis may be required. Once approved by DEQ, the plan and schedule shall be incorporated into the permit by reference and become an enforceable part of this permit.
  - c. If a minimum of twelve consecutive datapoints of groundwater data in all monitored parameters in Part I.A.3. subsequent to taking the corrective action in Part I.B.16.b. above show no significant difference compared to the upgradient well, then the permittee may petition the DEQ for reduced monitoring. Upon written notification from DEQ, the monitoring in Part I.A.3 shall be reduced from 1/Quarter to 1/6 months.

ATTACHMENT A

Monitoring Well Locations

Monitoring Station	Description/Location
MW-1	Monitoring Well #1 – Located 80 ft. upgradient from the spray irrigation field, northwest of the settling basin and tanks.
MW-2	Monitoring Well #2 – Located downgradient, adjacent to the southern edge of the spray irrigation field, outside of the sprayfield berm, but between the sprayfield and the stormwater pond.
MW-3	Monitoring Well #3 – Located downgradient and mid-field, within 10 ft. of the eastern edge of the spray irrigation field.

Month: \_\_\_\_\_  
Report Date: \_\_\_\_\_

I hereby certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Indicate below whether the following sampling results are submitted with this monitoring report :

Sampling Included	Sampling did not take place		
( )	( )	Attachment B.1 - Wastewater Monitoring (A daily operational log and any contractual lab certification sheets are required as an addendum to this report).	(1/Month)
( )	( )	Attachment B.2 Effluent Monitoring	(Monthly)
( )	( )	Attachment B.3a. Land Application Monitoring	(Monthly)
( )	( )	Attachment B.3b. Land Application Monitoring	(Annually)
( )	( )	Attachment B.4 Soil Monitoring	(Annually)
( )	( )	Attachment B.5. Groundwater Monitoring	(Quarterly)
( )	( )	Other _____	

Northern Neck Farmer's Market  
Northern Neck Vegetable Grower's Association  
1647 King's Hwy  
Colonial Beach, Va. 22443

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

Effluent Monitoring

VPA01422

Year: \_\_\_\_\_

Parameter	Influent Flow to Storage (Avg.)	Influent Flow to Storage (Monthly Total)	Volume from Storage to Sprayfield	Volume in Storage	Remaining Storage Capacity
Limits	NL	NL	NL	NL	NL
Units	MGD	MG	MG	MG	MG
Frequency	Continuous	Continuous	*****	1/Day	1/Day
Sample Type	Measure	Estimated	From B.3	Calculated	Calculated
Required Reporting	1/Month	1/Month	1/Month	1/Month	1/Month
Month	*****	*****	*****	*****	*****
January					
February					
March					
April					
May					
June					
July					
August					
September					
October					
November					
December					

ATTACHMENT B.3  
VPA MONITORING REPORT  
Location: Land Application Site  
Land Application

Page 1 of 1  
Northern Neck Farmer's Market

VPA01422

Month: \_\_\_\_\_

[illegible]

**Monitoring Required by VPA01422 Part I.A. Wastewater from Storage Pond to Spray Fields**

### Effluent Monitoring: Annual Parameters

VPA01422

Year: \_\_\_\_\_

[illegible]

ATTACHMENT B.4  
VPA MONITORING REPORT  
Location: Land Application Site  
Soil Monitoring: Yearly Parameters  
This monitoring is required by VPA01422 Part I.A. Soil Monitoring

VPA01422

Year: \_\_\_\_\_

Parameter	Soil pH	Cation Exchange Capacity	Available Phosphorus	Exchangeable Potassium	Hydraulic Conductivity
Limits	NL	NL	NL	NL	NL
Units	Standard Units	Milli-equivalents per 100 grams	Milligrams per Kilogram	Milligrams per Kilogram	Inches per Hour
Sample Type	Composite	Composite	Composite	Composite	Composite or in situ
Required Reporting	Annually	Annually	Annually	Annually	Annually
Date	*****	*****	*****	*****	*****

ATTACHMENT B.5.  
VPA MONITORING REPORT  
Location: Groundwater Monitor Wells  
Groundwater Monitoring

Page 1 of 2  
Northern Neck Farmer's Market

VPA01422  
Year: \_\_\_\_\_

Well Number GW 1

Parameter	Static Water Level	Chloride	Total Organic Carbon	pH	Sulfate	Total Kjeldahl Nitrogen (TKN)	Nitrate Nitrogen (NO <sub>3</sub> -N)	Total Dissolved Solids
Limits	NL	NL	NL	NL	NL	NL	NL	NL
Units	ft/MSL	mg/l	mg/l	S. U.	mg/l	mg/l	mg/l	mg/l
Sample Type	Measure	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Required Reporting	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year
Sample Date for sampling period submitted								
January-June								
July-December								

Well Number GW 2

Parameter	Static Water Level	Chloride	Total Organic Carbon	pH	Sulfate	Total Kjeldahl Nitrogen (TKN)	Nitrate Nitrogen (NO <sub>3</sub> -N)	Total Dissolved Solids
Limits	NL	NL	NL	NL	NL	NL	NL	NL
Units	ft/MSL	mg/l	mg/l	S. U.	mg/l	mg/l	mg/l	mg/l
Sample Type	Measure	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Required Reporting	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year
Sample Date for sampling period submitted								
January-June								
July-December								

ATTACHMENT B.5  
VPA MONITORING REPORT  
Location: Groundwater Monitor Wells  
Groundwater Monitoring

Page 2 of 2  
Northern Neck Farmer's Market

VPA01422  
Year: \_\_\_\_\_

Well Number GW 3

Parameter	Static Water Level	Chloride	Total Organic Carbon	pH	Sulfate	Total Kjeldahl Nitrogen (TKN)	Nitrate Nitrogen (NO <sub>3</sub> -N)	Total Dissolved Solids
Limits	NL	NL	NL	NL	NL	NL	NL	NL
Units	ft/MSL	mg/l	mg/l	S. U.	mg/l	mg/l	mg/l	mg/l
Sample Type	Measure	Grab	Grab	Grab	Grab	Grab	Grab	Grab
Required Reporting	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year	2/Year
Sample Date for sampling period submitted								
January-June								
July-December								

## CONDITIONS APPLICABLE TO ALL VPA PERMITS

A. Monitoring.

1. Samples and measurements taken as required by this permit shall be representative of the monitored activity.
2. Monitoring shall be conducted according to procedures listed under Title 40 Code of Federal Regulations Part 136, unless other procedures have been specified in this permit.
3. The permittee shall periodically calibrate and perform maintenance procedures on all monitoring and analytical instrumentation at intervals that will insure accuracy of measurements.

B. Records.

1. Records of monitoring information shall include:
  - a. The date, exact place, and time of sampling or measurements;
  - b. The name of the individual(s) who performed the sampling or measurements;
  - c. The date(s) and time(s) analyses were performed;
  - d. The name of the individual(s) who performed the analyses;
  - e. The analytical techniques or methods used, with supporting information such as observations, readings, calculations and bench data; and
  - f. The results of such analyses.
2. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least 3 years from the date of the sample, measurement, report or application. This period of retention may be extended by request of the Board at any time.

C. Reporting Monitoring Results.

1. The permittee shall submit the results of the monitoring required by this permit not later than the 10th day of the month after the monitoring takes place, unless another reporting schedule is specified elsewhere in this permit. Monitoring results shall be submitted to:

Piedmont Regional Office  
4949-A Cox Road  
Glen Allen, VA 23060

2. Monitoring results shall be reported on forms provided or specified by the Department.
3. If the permittee monitors the pollutant management activity, at a sampling location specified in this permit, for any pollutant more frequently than required by the permit using approved analytical methods, the permittee shall report the results of this monitoring on the monitoring report.
4. If the permittee monitors the pollutant management activity, at a sampling location specified in this permit, for any pollutant that is not required to be monitored by the permit,

and uses approved analytical methods, the permittee shall report the results with the monitoring report.

5. Calculations for all limitations which require averaging of measurements shall utilize an arithmetic mean unless otherwise specified in this permit.

D. Duty to Provide Information.

The permittee shall furnish to the Department, within a reasonable time, any information which the Board may request to determine whether cause exists for modifying, revoking and reissuing, terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Department, upon request, copies of records required to be kept by the permittee. Plans, specifications, maps, conceptual reports and other relevant information shall be submitted as requested by the Board prior to commencing construction.

E. Compliance Schedule Reports.

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Unauthorized Discharges.

Except in compliance with this permit, or another permit issued by the Board, it shall be unlawful for any person to:

1. Discharge into state waters sewage, industrial wastes, other wastes, or any noxious or deleterious substances; or
2. Otherwise alter the physical, chemical or biological properties of such state waters and make them detrimental to the public health, or to animal or aquatic life, or to the use of such waters for domestic or industrial consumption, or for recreation, or for other uses.

G. Reports of Unauthorized Discharges.

Any permittee who discharges or causes or allows a discharge of sewage, industrial waste, other wastes or any noxious or deleterious substance into or upon state waters in violation of Part II F; or who discharges or causes or allows a discharge that may reasonably be expected to enter state waters in violation of Part II F, shall notify the Department of the discharge immediately upon discovery of the discharge, but in no case later than 24 hours after said discovery. A written report of the unauthorized discharge shall be submitted to the Department, within five days of discovery of the discharge. The written report shall contain:

1. A description of the nature and location of the discharge;
2. The cause of the discharge;
3. The date on which the discharge occurred;
4. The length of time that the discharge continued;
5. The volume of the discharge;

G. Reports of Unauthorized Discharges (cont.).

6. If the discharge is continuing, how long it is expected to continue;
7. If the discharge is continuing, what the expected total volume of the discharge will be; and
8. Any steps planned or taken to reduce, eliminate and prevent a recurrence of the present discharge or any future discharges not authorized by this permit.

Discharges reportable to the Department under the immediate reporting requirements of other regulations are exempted from this requirement.

H. Reports of Unusual or Extraordinary Discharges.

If any unusual or extraordinary discharge including a bypass or upset should occur from a treatment works and the discharge enters or could be expected to enter state waters, the permittee shall promptly notify, in no case later than 24 hours, the Department by telephone after the discovery of the discharge. This notification shall provide all available details of the incident, including any adverse affects on aquatic life and the known number of fish killed. The permittee shall reduce the report to writing and shall submit it to the Department within five days of discovery of the discharge in accordance with Part II I 2. Unusual and extraordinary discharges include but are not limited to any discharge resulting from:

1. Unusual spillage of materials resulting directly or indirectly from processing operations;
2. Breakdown of processing or accessory equipment;
3. Failure or taking out of service some or all of the treatment works; and
4. Flooding or other acts of nature.

I. Reports of Noncompliance

The permittee shall report any noncompliance which may adversely affect state waters or may endanger public health.

1. An oral report shall be provided within 24 hours from the time the permittee becomes aware of the circumstances. The following shall be included as information which shall be reported within 24 hours under this paragraph:
  - a. Any unanticipated bypass; and
  - b. Any upset which causes a discharge to surface waters.
2. A written report shall be submitted within 5 days and shall contain:
  - a. A description of the noncompliance and its cause;
  - b. The period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
  - c. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

I. Reports of Noncompliance (cont.)

The Board may waive the written report on a case-by-case basis for reports of noncompliance under Part II I if the oral report has been received within 24 hours and no adverse impact on state waters has been reported.

3. The permittee shall report all instances of noncompliance not reported under Parts II I 1 or 2, in writing, at the time the next monitoring reports are submitted. The reports shall contain the information listed in Part II I 2.

**NOTE: The immediate (within 24 hours) reports required in Parts II F, G and H may be made from 8:15 A.M. - 5:00 P.M. to the Department's Piedmont Regional Office at (804) 527-5020 and this shall fulfill the immediate reporting requirement. For emergencies, the Virginia Department of Emergency Services maintains a 24 hour telephone service at 1-800-468-8892.**

J. Notice of Planned Changes.

1. The permittee shall give notice to the Department as soon as possible of any planned physical alterations or additions to the design or operation of the pollutant management activity.
2. The permittee shall give at least 10 days advance notice to the Department of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

K. Signatory Requirements.

1. Applications. All permit applications shall be signed as follows:
  - a. For a corporation: by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding \$25 million (in second-quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;
  - b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or
  - c. For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a public agency includes: (i) The chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency.

K. Signatory Requirements (cont.).

2. Reports, etc. All reports required by permits, and other information requested by the Board shall be signed by a person described in Part II K 1, or by a duly authorized representative of that person. A person is a duly authorized representative only if:
  - a. The authorization is made in writing by a person described in Part II K 1;
  - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and
  - c. The written authorization is submitted to the Department.
3. Changes to authorization. If an authorization under Part II K 2 is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part II K 2 shall be submitted to the Department prior to or together with any reports, or information to be signed by an authorized representative.
4. Certification. Any person signing a document under Parts II K 1 or 2 shall make the following certification: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

L. Duty to Comply.

The permittee shall comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the State Water Control Law. Permit noncompliance is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. Compliance with a permit during its term constitutes compliance, for purposes of enforcement, with the State Water Control Law.

M. Duty to Reapply.

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee shall apply for and obtain a new permit. All permittees with a currently effective permit shall submit a new application at least 180 days before the expiration date of the existing permit, unless permission for a later date has been granted by the Board. The Board shall not grant permission for applications to be submitted later than the expiration date of the existing permit.

N. Effect of a Permit.

This permit does not convey any property rights in either real or personal property or any exclusive privileges, nor does it authorize any injury to private property or invasion of personal rights, or any infringement of federal, state or local law or regulations.

O. State Law.

Nothing in this permit shall be construed to preclude the institution of any legal action under, or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any other state law or regulation or under authority preserved by Section 510 of the Clean Water Act. Except as provided in permit conditions on "bypassing" (Part II U), and "upset" (Part II V) nothing in this permit shall be construed to relieve the permittee from civil and criminal penalties for noncompliance.

P. Oil and Hazardous Substance Liability.

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Sections 62.1-44.34:14 through 62.1-44.34:23 of the State Water Control Law.

Q. Proper Operation and Maintenance.

The permittee shall be responsible for the proper operation and maintenance of all treatment works, systems and controls which are installed or used to achieve compliance with the conditions of this permit. Proper operation and maintenance includes effective plant performance, adequate funding, adequate staffing, and adequate laboratory and process controls, including appropriate quality assurance procedures.

R. Disposal of solids or sludges.

Solids, sludges or other pollutants removed in the course of treatment or management of pollutants shall be disposed of in a manner so as to prevent any pollutant from such materials from entering state waters.

S. Duty to Mitigate.

The permittee shall take all reasonable steps to minimize or prevent any pollutant management activity in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

T. Need to Halt or Reduce Activity not a Defense.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

U. Bypass.

1. Prohibition - Bypass means intentional diversion of waste streams from any portion of a treatment works. A bypass of the treatment works is prohibited except as provided herein.
2. Anticipated Bypass - If the permittee knows in advance of the need for a bypass, he shall notify the Department promptly at least 10 days prior to the bypass. After considering its adverse effects the Board may approve an anticipated bypass if:
  - a. The bypass will be unavoidable to prevent loss of human life, personal injury, or severe property damage ("Severe Property Damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production); and
  - b. There are no feasible alternatives to bypass such as the use of auxiliary treatment facilities, retention of untreated waste, or maintenance during normal periods of equipment downtime. However, if bypass occurs during normal periods of equipment downtime or preventive maintenance and in the exercise of reasonable engineering judgment the permittee could have installed adequate backup equipment to prevent such bypass, this exclusion shall not apply as a defense.
3. Unplanned Bypass - If an unplanned bypass occurs, the permittee shall notify the Department as soon as possible, but in no case later than 24 hours, and shall take steps to halt the bypass as early as possible. This notification will be a condition for defense to an enforcement action that an unplanned bypass met the conditions in paragraphs U 2 a and b and in light of the information reasonably available to the permittee at the time of the bypass.

V. Upset.

A permittee may claim an upset as an affirmative defense to an action brought for noncompliance. In any enforcement proceedings a permittee shall have the burden of proof to establish the occurrence of any upset. In order to establish an affirmative defense of upset, the permittee shall present properly signed, contemporaneous operating logs or other relevant evidence that shows:

1. That an upset occurred and that the cause can be identified;
2. That the permitted facility was at the time being operated efficiently and in compliance with proper operation and maintenance procedures;
3. That the 24-hour reporting requirements to the Department were met; and
4. That the permittee took all reasonable steps to minimize or correct any adverse impact on state waters resulting from noncompliance with the permit.

W. Inspection and Entry.

Upon presentation of credentials, any duly authorized agent of the Board may, at reasonable times and under reasonable circumstances:

1. Enter upon any permittee's property, public or private and have access to records required by this permit;
2. Have access to, inspect and copy any records that must be kept as part of permit conditions;
3. Inspect any facility's equipment (including monitoring and control equipment) practices or operations regulated or required under the permit; and
4. Sample or monitor any substances or parameters at any locations for the purpose of assuring permit compliance or as otherwise authorized by the State Water Control Law. For purposes of this section, the time for inspection shall be deemed reasonable during regular business hours, and whenever the facility is involved in managing pollutants. Nothing contained herein shall make an inspection unreasonable during an emergency.

X. Permit Actions.

Permits may be modified, revoked and reissued, or terminated for cause upon the request of the permittee or interested persons, or upon the Board's initiative. If a permittee files a request for a permit modification, revocation, or termination, or files a notification of planned changes, or anticipated noncompliance, the permit terms and conditions shall remain effective until the request is acted upon by the Board. This provision shall not be used to extend the expiration date of the effective VPA permit.

Y. Transfer of Permits.

1. Permits are not transferable to any person except after notice to the Department. The Board may require modification or revocation and reissuance of the permit to change the name of the permittee and to incorporate such other requirements as may be necessary. Except as provided in Part II Y 2, a permit may be transferred by the permittee to a new owner or operator only if the permit has been modified to reflect the transfer or has been revoked and reissued to the new owner or operator.
2. As an alternative to transfers under Part II Y 1, this permit shall be automatically transferred to a new permittee if:
  - a. The current permittee notifies the Department at least 30 days in advance of the proposed transfer of the title to the facility or property;
  - b. The notice includes a written agreement between the existing and new permittees containing a specific date for transfer of permit responsibility, coverage, and liability between them; and

Y. Transfer of Permits, cont.

- c. The Board does not, within the 30-day time period, notify the existing permittee and the proposed new permittee of its intent to modify or revoke and reissue the permit.

Z. Severability.

The provisions of this permit are severable, and if any provision of this permit or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

### VPA Permit Fact Sheet

This document gives pertinent information concerning the reissuance of VPA Permit No. VPA01422. The permit regulates pollutant management activities of the Northern Neck Farmers Market at their Oak Grove site. The Northern Neck Farmers Market is an industrial facility located at the Parker Farms site on Rt. 3 in Oak Grove. The company processes, packages, stores and ships produce during their operating season of April through November, with wastewater generation from June through November. The wastewater is then land applied to a fescue grassfield at the site that is owned by the Virginia Department of Agriculture and Consumer Services.

1. Facility Name and Address: Northern Neck Farmers Market  
1647 Kings Hwy  
Colonial Beach, Va. 22443

Owner Name and Address: Northern Neck Vegetable Growers Association  
3421 Horners Mill Road  
Montross, Va. 22520  
Gary Allensworth, President

Location of Pollution Management Activity: Rt. 3 at Oak Grove (See Attachment A)  
County: Westmoreland

3. Facility Contact: Rod Parker or Jimmy Carter, General Manager and Operations Manager  
Parker Farms  
1647 Kings Hwy  
Colonial Beach, Va. 22443  
804-224-1990

4. Permit Drafted By:	D. Mosca - PRO	Date:	October 7, 2008
Site Inspection (Attach. D):	Mike Dare - PRO	Date:	Feb. 7, 2008
Reviewed By:	T. Cohen - PRO	Date:	November 4, 2008
	Ray Jenkins - PRO	Date:	December 5, 2008

5. Permit Characterization: SIC Code: 4221

Permit Type	Facility	Permit Action
<input checked="" type="checkbox"/> Existing Facility	<input type="checkbox"/> Municipal	<input type="checkbox"/> Issuance
<input type="checkbox"/> Proposed Facility	<input checked="" type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Reissuance
<input checked="" type="checkbox"/> Land Application:	<input type="checkbox"/> Conc. Animal Feeding	<input type="checkbox"/> Modification
<input checked="" type="checkbox"/> Frequent	<input type="checkbox"/> Inten. Animal Feed	<input type="checkbox"/> NDC Conversion
<input type="checkbox"/> Infrequent	<input type="checkbox"/> Other Animal	<input type="checkbox"/> Inter. Authorization
<input checked="" type="checkbox"/> Land App. Wastewater	<input type="checkbox"/> Aquaculture	<input type="checkbox"/> Enforcement Action
<input type="checkbox"/> Other: Recycle and Reuse		<input type="checkbox"/> Revoke and Reissue

6. Statutory or Regulatory Basis for Special Conditions and Monitoring Requirements:
- (X) State Water Control Law
  - (X) 9 VAC 25 – 32 Permit Regulation
  - (X) Water Quality Standards (Surface 9 VAC 25-260 and Groundwater 9 VAC 25-280)
  - (X) Agency Guidance - VPA Manual
7. Application Information:
- Application Submitted By: Rod Parker, Manager and signed by Gary Allensworth of the Northern Neck Vegetable Growers Association 6-24-08
- Additional Information: Requested: 7-2-08, 9-8-08 Received: 8-11-08, 10-27-08  
11-5-08 12-12-08
- Application Complete Date: 12-22-08. The permit expired 6-30-08.
8. Pollution Management Activity Description: The pollutant management activities involve the seasonal land application of a range of 1,000 gpd to 7,000 gpd on average of industrial wastewater generated during fruit and vegetable processing – flume water only. The wastewater is generated through fruit and vegetable processing/packaging/storage/cleaning and shipping activities and land applied onto one acre in Westmoreland County. The facility operates from April through November each year, with wastewater generation from June to November. The facility processes broccoli and greens, cucumbers, peppers and sweet corn. Melons are no longer processed. The facility collects the wastewater into three above ground polyethylene storage tanks (total 20,400 gal.) prior to spraying. The wastewater also contains 400 gallons per week of rainwater that blows into the structure, and 100 gallons per week of equipment cleaning wash water with no detergents or other soaps. In the winter after the facility has shut down for the season and all the equipment has been cleaned, the contents of the settling tank is emptied into the storage tanks. At that time, when there may be no subsequent commingling of process wastewater and storm water, the valve on the settling tank is opened so that rainwater that collects is drained into the marsh. The productivity class of the soil is III; for a fescue/orchardgrass pasture, the nitrogen uptake is expected to be 100 lb/N/acre (Guidance memo 95-006) plus a 20 lbN/acre credit for irrigation according to Va. Tech and DCR (see Attachment H).
9. Location Description: Rt. 3 at Oak Grove, 1.5 miles east of the Westmoreland Co./King George Co. line. The facility is located in Westmoreland County, and is included on the Rollins Fork Topo map (168A). (See Attachment A)

## 10. Changes to the Permit

Permit Processing Change Sheet for Permit Part I – Monitoring Requirements					
Monitoring	Parameter Changed	Requirement Changed From	Requirement Changed To	Rationale	Initials and Date
Cover Page		Change in Boilerplate	Removal of "Board's"	Per 2008 permit manual	10/08 DMM
A.1., A.2, A.3 of 1998 permit, A.1.a, b in 2008 permit		Reference to site listed in Attachment A	Reference to site listed Part I.A. page itself.	More concise format.	10/08 DMM
A.1.a. of 2009 permit, A.2 of 1998 permit	Changed "metals" to "total recoverable metals"			To clarify metals form	10/08 DMM
A.1.a. of 2009 permit, A.2 of 1998 permit	Added Sodium and Chloride. Changed Nitrate parameter to be Nitrate-Nitrite			The addition con-forms to 93-023 guidance. In order to measure PAN, TKN + NOx is needed, and measuring only nitrate assumed nitrite to be negligible.	9/08 DMM

Permit Processing Change Sheet for Permit Part I – Monitoring Requirements					
Monitoring	Parameter Changed	Requirement Changed From	Requirement Changed To	Rationale	Initials and Date
A.1.a. of 2009 permit, A.2 of 1998 permit	Dropped the following parameter: Triademefon (Bayleton 50DF)	Triademefon (Bayleton 50DF)	Chlorothalomil (Bravo)	Bayleton is a discontinued fungicide. Bravo is a popular fungicide used on crops processed at the Farmer's Market.	1/09 DMM
A.1.a. of 2009 permit, A.2 of 1998 permit	Footnotes (1) and (2) denoting most used and most toxic chemicals	Footnoted on Part I.A. page	Noted in staff comments in Fact sheet.	This information is more appropriate to the fact sheet.	12/08 DMM
A.3.a. and d. of 2009 Permit, A.10 of 1998 permit	Groundwater monitoring frequency	2/Year	Quarterly	Since a CAP is being required, the sampling frequency specified in 01-2005 is appropriate.	2/09 DMM
A.3 . of 2009 permit, A.11 of 1998 permit		Referred to approved ground-water mon. plan	Mon. wells are listed in Attachment A	Now that an approved plan exists, it seems concise to list the wells	10/08 DMM
A.3	Revised wording	At least 3 well volumes of groundwater shall be withdrawn prior to sampling each monitoring well.	The wells shall be properly purged prior to sampling.	To allow for an alternate purging method.	9/08 DMM

Permit Processing Changes - Special Conditions

Special conditions have been updated in accordance with 2008 revision to the VPA permit manual.

Condition in 2009 permit	Condition in 1998 permit	Changes
B.1.	B.5	Since there is only one site, "site" was denoted as singular. Reference was also changed from Attach. A to Part I.A.
	B.6.	Condition removed as it was redundant with information on Part I.A. page.
B.2.	B.7.	Wording updated per V. Rourke email dated 11-5-08 (Attachment H)
B.3	B.8.	Wording changed slightly in accordance with 2008 VPA manual, submittal dates changed
B.4.	B.9	Wording changed slightly in accordance with 2008 VPA manual, submittal dates changed.
B.5.	B.1.	Wording changed in accordance with 2008 VPA manual.
B.6.	B.2.	None.
B.7.		New condition--Freeboard condition is required in the 2008 VPA manual.
B.8.	B.3.	Wording updated, VPDES condition customized to include VPA pertinent elements and cation balance plan per V. Rourke email dated 11-5-08 (Attach. H).
B.9.	C.3.(#1).	Buffer zones updated (increased) in accordance with 2008 VPA manual.
B.10.		Wind restriction – new condition in the 2008 VPA manual.
B.11.	C.4.	Closure plan – revised from old permit to include closure of monitoring wells.
	B.4.	Condition was satisfied, so not continued

Permit Processing Changes - Special Conditions		
Special conditions have been updated in accordance with 2008 revision to the VPA permit manual.		
Condition in 2009 permit	Condition in 1998 permit	Changes
B.12.	C.1.	Cease operation, a condition from G.M. 01-2005 changed to require the permittee to provide additional storage should DEQ determine that it is needed.
B.13.	C.3.(#2).	Change in pesticide usage. No change in wording.
B.14.	B.10.	PAN. Condition customized to include the specific PAN loading and productivity class for the NN Farmers Market application site, and require record keeping of any nitrogen additions.
	B.11.	WW application to be controlled by plant growth schedule—sounds unenforceable, so omitted.
B.15.		Maintain adequate groundcover – language used from another VPA permit.
B.16.	C.2.	Seepage from the storage facility – Condition customized to require a plan and schedule for corrective action, and potential sampling frequency change afterwards.
		Removal of Attachment A – Land Application site
		Removal of Attachment B-2 – Estimated Crop Yields
		Removal of Attachment B-3 – Legume Nitrogen Credits
		Removal of Attachment C – Monitoring Well Locations, now Attachment A
		Changes in Attachment D.2. – Effluent Monitoring Reports – Reports are now Attachment B and have been updated in accordance with the permit.

11. Facility Reliability Class: NA—not a sewage facility

12. Licensed Operator Requirements: None.

13. Basis for Monitoring Requirements:

Wastewater Monitoring – Final Limitations					
Monitoring Location: Wastewater "Pit"					
PARAMETERS	UNITS	LIMITATION	FREQUENCY	TYPE	BASIS
Flow	MG	NL	Monthly	Estimate	Guidance Memo 01-2005
Application Rate	In/hr	0.25	Monthly	Calculate	Guidance Memo 01-2005
Application Rate	in/day	1.0	Monthly	Calculate	Guidance Memo 01-2005
Application Rate	In/wk	2.0	Monthly	Calculate	Guidance Memo 01-2005
pH	S.U.	NL	1/Year	Grab	Guidance Memo 01-2005
TKN	mg/l	NL	1/Year	Composite	Component of PAN
NOx	mg/l	NL	1/Year	Composite	Component of PAN
PAN	mg/l	NL	1/Year	Calculate	Guidance Memo 01-2005
Total Sodium	mg/l	NL	1/Year	Composite	Best Professional Judgment (BPJ)—needed to perform cation balance
Total Chloride	mg/l	NL	1/Year	Composite	BPJ - Could adversely affect sprayfield, causes soil structure changes
Pounce	ug/l	NL	1/Year	Composite	Guidance Memo 01-2005—Appl. identifies as most common agrochemical
Metaxyl	ug/l	NL	1/Year	Composite	Guidance Memo 01-2005—Appl. identifies as most toxic agrochemical
Chlorothalomil	ug/l	NL	1/Year	Composite	Guidance Memo 01-2005 owner identified as a toxic agrochemical.
Total Copper	Rec. ug/l	NL	1/Year	Composite	Guidance Memo 01-2005 states that any metals incorporated in agrochemicals shall be required for monitoring.

Wastewater Monitoring – Final Limitations					
PARAMETERS	UNITS	LIMITATION	FRE- QUENCY	TYPE	BASIS
Total Rec. Manganese	ug/l	NL	1/Year	Composite	Guidance Memo 01-2005 states that any metals incorporated in agrochemicals shall be required for monitoring.
Soils Monitoring – Final Limitations					
Monitoring Location: Land Application Sprayfield					
PARAMETERS	UNITS	LIMITATION	FRE- QUENCY	TYPE	BASIS
pH	S.U.	NL	1/Year	Composite	Guidance Memo 01-2005
Cation Exchange Capacity	Meq/100g	NL	1/Year	Composite	Guidance Memo 01-2005
Available Phosphorus	mg/kg	NL	1/Year	Composite	Guidance Memo 01-2005
Exchangeable Potassium	mg/kg	NL	1/Year	Composite	Guidance Memo 01-2005
Hydraulic Conductivity	In/hr	NL	1/Year	Composite or in situ	Guidance Memo 01-2005
Groundwater Monitoring– Final Limitations					
Monitoring Location: MW-1, MW-2, MW-3					
PARAMETERS	UNITS	LIMITATION	FREQUENCY	TYPE	BASIS
Static Water Level	Ft.	NL	Quarterly	Measured	Guidance Memo 01-2005
Chloride	mg/l	NL	Quarterly	Grab	Guidance Memo 01-2005
Total Kjeldahl Nitrogen	mg/l	NL	Quarterly	Grab	Downgradient data exceeded upgradient, will potentially reflect any active N contamination
Nitrate- nitrite Nitrogen	mg/l	NL	Quarterly	Grab	Guidance Memo 01-2005
Total Organic Carbon	mg/l	NL	Quarterly	Grab	Guidance Memo 01-2005
pH	S.U.	NL	Quarterly	Grab	Guidance Memo 01-2005
Sulfate	mg/l	NL	Quarterly	Grab	Guidance Memo 01-2005
Total Dissolved Solids	mg/l	NL	Quarterly	Grab	Guidance Memo 01-2005

## 14. Permit Special Conditions: Rationale

B.1. Location of Wastewater Application. Required by VPA manual and GM 01-2005.

B.2. Operational Limitations in inclement weather. Required by VPA manual, with wording updated per V. Rourke email dated 11-5-08 (Attach. H). Section (d).3. was customized with the substitution of the words “to prevent” instead of “precludes” for clarity.

B.3. Summary Report. Required by VPA manual and GM 01-2005. Customized with additional language to indicate that different parts of the report are not due each month.

B.4. Annual Summary Report. Required by VPA manual and current guidance. A clarification for the previous “calendar year” is added to the permit boilerplate. Section (b) is customized

to add tracking of available storage volume., (d) is customized by the specification of the words "lime," "nitrogen" and "fertilizer" so as not to preclude any nutrient source through condition language.

- B.5. Stormwater Discharge Exception. 9 VAC 25-32-30 of the VPA permit regulation requires that all pollutant management activities covered under a VPA permit maintain no point source discharge of pollutants to surface waters except in the case of a storm event greater than the 25-year, 24- hour storm.
- B.6. Materials Handling/Storage. 9 VAC 25-32-30 requires that all pollutant management activities covered under a VPA permit shall maintain no point source discharge of pollutants to surface waters except in the case of a storm event greater than the 25-year, 24-hour storm.
- B.7. Freeboard. Required by VPA manual.
- B.8. O&M manual. 9 VAC 25-32 requires proper management of pollutants for the protection of surface water and ground water. Updating the current O&M manual is a way to keep a reference for staff for protection of water resources. A disposal plan for the sediment from the settling basins shall be developed as an update to this manual and will become an enforceable part of the permit upon approval from DEQ – PRO. This condition has been customized for land application from the VPDES permit condition to include VPA pertinent elements and a cation balance plan per V. Rourke email dated 11-5-08 (Attachment H). In addition, because a current O&M manual exists for this facility, the permit boilerplate language to develop an O&M manual if it does not already exist was deleted.
- B.9. Buffer Zones. Required by VPA manual.
- B.10. Wind Restriction. Required by VPA manual.
- B.11. Facilities Closure Plan upon termination of activities. 9 VAC 25-32-50 E.6. requires that an appropriate plan of closure or abandonment be developed by the permittee and approved by the board when the facility ceases to be utilized. Required by VPA manual and GM 01-2005.
- B.12. Requirement to Provide Additional Storage. Condition B.7 from DEQ Guidance Memo 01-2005 requires the ceasing of operation upon reaching storage holding capacity. In the event of insufficient storage capacity, in order to prevent the need to land apply wastewater at times that would contribute to runoff or contamination of groundwater, the permit condition was augmented with language that requires that the facility notify DEQ of any ceasing of operation and provide plans for additional storage within 60 days of being notified by DEQ.
- B.13. Change in Pesticide Usage. Required by current guidance (Site specific condition no.5, GM 01-2005).
- B.14. Pan Loading Rate. Required by VPA manual and current guidance (Conditions specific to food processing category, condition no.6, GM 01-2005). Customized by combining with VPA permit manual 2008, Land Treatment of Industrial Wastewater, No. 21 (the word "residuals" is used in the manual in error), and language for the permittee to maintain nitrogen application records, and submit the total calculation with the yearly report. Because there is only one field for wastewater application, the PAN and the productivity class are specifically listed in this condition to avoid the need for an attachment with this information. The PAN calculation is clarified by specifying the use of the previous calendar year's

wastewater calculations, which are expected to provide 6 data points for the months of operation of June to November.

- B.15. **Maintain Adequate Groundcover.** In order for the wastewater to properly be taken up by the crop to prevent the migration of nutrients, it is necessary to require that the facility maintain adequate groundcover for the wastewater application.
- B.16. **Groundwater.** This is a customized condition to address potential groundwater effects from activities on site. In the event of any activities onsite that are determined to have adversely impacted groundwater, the facility is required to submit a plan of action for mitigation and remediation of groundwater. Because the groundwater evaluation showed significant differences in the downgradient wells for some parameters compared with the upgradient well, the permittee is being required to submit a corrective action plan. See Attachment E for discussion.
15. **Public Notice:** The draft permit was public noticed in the Westmoreland News and no comments were received except those from the owner protesting the groundwater monitoring frequency. See staff comments, below (fourth bulleted item).  
Notice Information required by 9 VAC 25-31-280 B:  
Comment period Start date: April 23, 2009 End date: May 26, 2009  
Dates of Publication: April 22 and April 29, 2009

**HOW TO COMMENT AND/OR REQUEST A PUBLIC HEARING:** DEQ accepts comments and requests for public hearing by e-mail, fax or postal mail. All comments and requests must be in writing and be received by DEQ during the comment period. Submittals must include the names, mailing addresses and telephone numbers of the commenter/requester and of all persons represented by the commenter/requester. A request for public hearing must also include: 1) The reason why a public hearing is requested. 2) A brief, informal statement regarding the nature and extent of the interest of the requester or of those represented by the requester, including how and to what extent such interest would be directly and adversely affected by the permit. 3) Specific references, where possible, to terms and conditions of the permit with suggested revisions. DEQ may hold a public hearing, including another comment period, if public response is significant and there are substantial, disputed issues relevant to the permit.

Contact for public comments, document requests and additional information: Ms. Denise Mosca at: Virginia Department of Environmental Quality Piedmont Regional Office 4949-A Cox Road, Glen Allen, VA 23060, Telephone No. (804) 527-5027

E-mail address: dmmosca@deq.virginia.gov. The public may review the draft permit and application at the DEQ office named above by appointment.

16. **Staff Comments:**
- Pounce was identified by the applicant in the application dated December 11, 2008 as the most commonly used agrochemical that may appear in the wastewater. Metaxly (Ridomil/Copper) was identified by the applicant in the application dated December 11, 2008 as one of the more toxic agrochemicals that may appear in the wastewater. In the previous application for the permit issuance, Triadimefon (Bayleton 50DF) was also identified as a toxic agrochemical. In a telephone conversation on January 12, 2008, Mr. Parker said that Bayleton has been discontinued by the industry. He said that it is a fungicide; fungicides used now are Bravo, Kocide (copper) and Manex (Manganese). Bravo has been selected as a substitute for the Bayleton in the wastewater monitoring as the Kocide and Manex presence in the wastewater may be indicated by copper and manganese monitoring.
  - Buffer zone requirements in the previous permit have been increased in accordance with the 2008 VPA manual. See permit condition I.B.9. Alterations to current irrigation practices to meet the increased buffers are not anticipated to be needed, with the exception of the increase of 50 ft. to 100 ft. to property lines. The north end of the sprayfield is only 50 ft. from the property line in the trees. Mr. Parker indicated in a telephone conversation 12-17-

08 that the wetted area of the field is approximately 100 ft. from the property line there since the spray nozzle is about 140 ft. to the property line. A wooded swampy area runs along that property line that is owned by the Balwanz family that live across Rt. 3 from the facility. The permittee may need to more closely monitor their irrigation practices to ensure the wetted area of the irrigation field maintains the 100 ft. required buffer to the north property boundary.

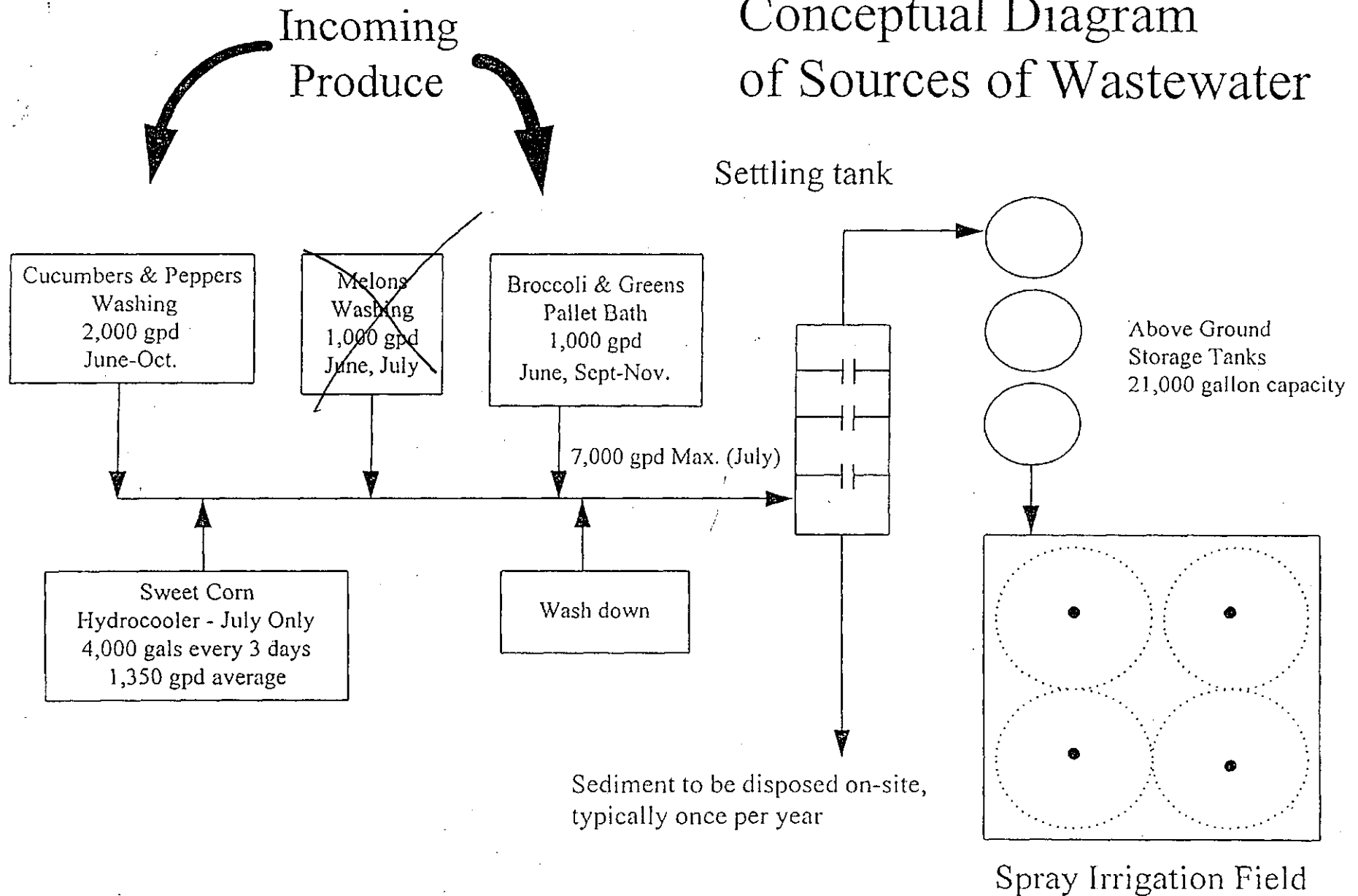
- A corrective action plan is requested from the permittee to address concerns identified in the groundwater analysis performed for this permit reissuance. Appropriate corrective action must include the certification by a professional of the construction of the wells as being undamaged, and a revision to the Operations and Maintenance manual to include the removal of the hay from the sprayfield after cutting (See Attachment E for discussion).
- As a result of public comment from the owner, an addition to the above condition was made. After 12 consecutive datapoints of groundwater data for each parameter in Part I.A.3. are collected subsequent to the corrective action, if no significant difference is seen from the upgradient well, then the permittee may petition the DEQ for reduced monitoring. Upon written notification from DEQ, the groundwater monitoring frequency shall be reduced from 1/Quarter to 1/6 months. This does not represent a backsliding issue as the monitoring frequency in the 1998 permit is 1/6 months.
- The O&M manual is required to be updated with a cation imbalance plan. See Attachment G for V. Rourke's email of November 5, 2008. In accordance with the email, the cation imbalance plan is being required in place of a requirement for soil liming (boilerplate condition No. 19, 2008 VPA manual, Section V, page 55). That condition referred to residuals, and when Central Office was asked about it, they indicated that since the section referred to industrial effluent, it was not necessary and that the VPA Committee members agreed that salinity and cation balance were more important to monitor than pH in the soil where metals in the wastewater were not an issue. Refer to the System Design Check in Attachment G for the metals and site life evaluation.
- The permittee indicated that the crop that is sprayed is not orchardgrass, but fescue. G.M. 95-006 shows a PAN of 100 lb/yr. for fescue for a Productivity Class of III. Information provided from VRO (Attachment H) from DCR and Va. Tech allows for a 20 lb/yr credit for irrigated fescue for a field site rated at Productivity Class III. Therefore, the total PAN for the Northern Neck Farmer's Market is 120 lb/yr. See Attachment H for the information from VRO documenting conversations with DCR and Va. Tech staff.
- The units for exchangeable potassium are shown in G.M. 01-2005 as mg/100g, and the 1998 permit used units of mg/kg. For the sake of consistency and comparability of soils results, the units of mg/kg are being retained in this current permit action.
- VPA permit manual special condition 9 (Manual section V. p. 53) is not included in this permit because there is only one authorized spray field which is specified in Part. I.A.
- VPA permit manual special condition 20 (Manual section V. p. 55) to direct the permittee to operate the facility in accordance with the nutrient management plan was not included in the 2009 permit. Since the facility is limited hydraulically and not by nutrients (System Design Check, Attachment G), the facility was not required to pursue a nutrient management plan. The 2009 VPA permit provides permit limits for wastewater application rates as well as a nitrogen (PAN) limit to be protective.

17. Attachments:

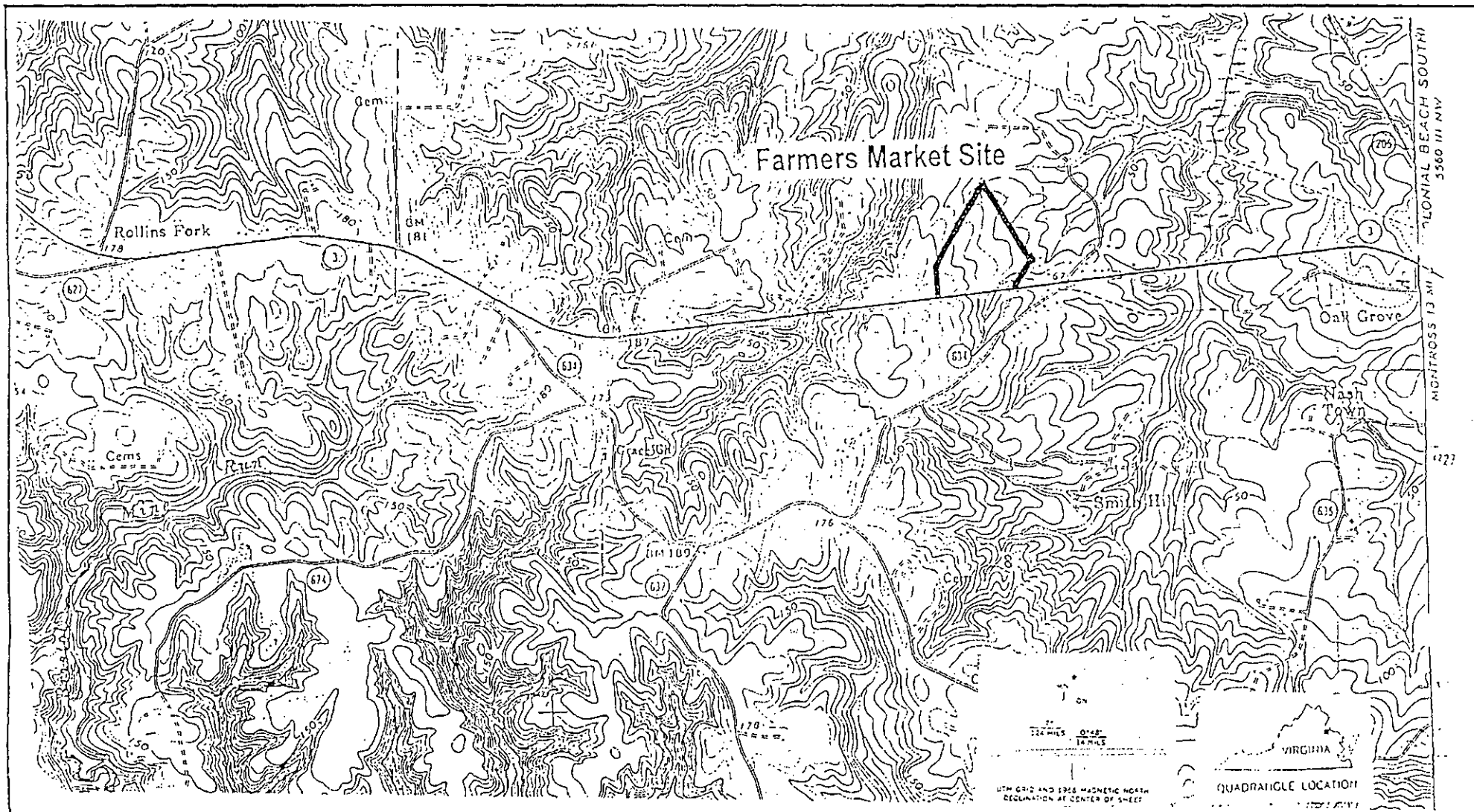
- A. Topo map/Site Diagram
- B. Groundwater Monitoring Well Location/Potentiometric Map
- C. VPA Permit Checklist
- D. Inspection Report
- E. Groundwater Data Summary
- F. Recommended PAN Rates (GM 95-006)
- G. System Design Information and Calculations
- H. Email from Central Office, Technical information from VRO

**ATTACHMENT A.**

# Conceptual Diagram of Sources of Wastewater



**ATTACHMENT B.**



**Baker**

Michael Baker, Jr., Inc.  
Richmond, VA

Virginia  
Department of Agriculture  
and Consumer Services

Northern Neck  
Farmers' Market  
Westmoreland County, Virginia

Location Map

Source: USGS Topographic Quadrangle - Rollins Fork, Va  
Scale = 1" = 2,000'

WILLIAM WALTER, JR.  
AND MARY BALWANTZ  
D.B. 431, Pg. 308

MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES  
1. THE DESIGNER SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF THE FACILITY TO INSURE THAT IT FUNCTIONS PROPERLY. A 10% MAINTENANCE FUND SHALL BE ESTABLISHED FOR EACH PROJECT. PROCEEDS FROM THE MAINTENANCE FUND SHALL BE USED TO COVER THE COSTS OF MAINTENANCE OF THE FACILITY. THE FUND SHALL BE MAINTAINED SEPARATELY FROM THE PROJECT FUND. THE FUND SHALL BE MAINTAINED AT ALL TIMES. THE FUND SHALL BE MAINTAINED AT ALL TIMES.

- GENERAL NOTES
1. ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON UTM DATUM. 2.5M ELEVATION HAS BEEN SET ON THIS SITE. SEE PLAN FOR LOCATION AND ELEVATION.
  2. ALL CONSTRUCTION ON THIS PROJECT SHALL BE IN ACCORDANCE WITH 2001 ROAD DESIGN STANDARDS AND SPECIFICATIONS, UNLESS SUPPLEMENTED BY SUPERSEDING OTHER SPECIFICATIONS WHICH ARE MADE PART OF THESE PLANS. THE CONTRACTOR SHALL SECURE COPIES OF ALL PERTINENT CODES, STANDARDS AND SPECIFICATIONS, SPECIFICATIONS SPECIFIC TO THIS PROJECT, AND THE RECORD OF SURVEY, EXPLORATION AND GEOLOGICAL ENGINEERING EVALUATION BY PERMITS DATED SEPTEMBER 2001.
  3. THE CONTRACTOR SHALL SECURE ALL NECESSARY PERMITS AND SHALL NOTIFY APPROPRIATE AGENCIES AS SOON BEFORE START OF WORK.
  4. ALL STORMWATER CONSTRUCTION IS TO BE IN ACCORDANCE WITH CURRENT 2001 ROAD DESIGN STANDARDS AND ROADWAY BRIDGE SPECIFICATIONS INCLUDING ALL LATEST REVISIONS.
  5. REMOVAL OF UNDESIRABLE MATERIAL, DEWATERING, UNDERCUTTING, OR CONSTRUCTION OF IN-SITU MATERIALS, PLACEMENT OF SUBGRADE, REQUIRED PLACEMENT OF CONCRETE FILL, SHALL BE IN ACCORDANCE WITH SPECIFICATIONS TO BE MADE A PART OF THESE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISPOSING OF UNDESIRABLE MATERIAL. EXCESS ELEVATION WILL BE RESPONSIBLE FOR SECURING NECESSARY PERMITS.
  6. ALL STORMWATER MANAGEMENT FACILITIES SHALL BE DESIGNED AND CONSTRUCTED BY A LICENSED PROFESSIONAL ENGINEER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING NECESSARY PERMITS.
  7. THE LOCATION OF EXISTING UTILITIES, DEPTHS, AND THE LINE OF PROPOSED WORK IS NOT NECESSARILY SHOWN ON THE PLANS AND WHERE SHOWN IS ONLY APPROXIMATE. THE CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMITS AND AT ALL TIMES MAINTAIN PROTECTIVE UNDERPASSES, TUNNELS, AND STRUCTURES AS NECESSARY. ALL STRUCTURES SHALL BE AT LEAST 20' FROM ALL EXISTING UTILITIES. ALL STRUCTURES SHALL BE AT LEAST 20' FROM ALL EXISTING UTILITIES.
  8. UNLESS OTHERWISE STATED ON DRAWING, THERE SHALL BE A STRAIGHT LINE GRADE BETWEEN SPOT ELEVATIONS.
  9. STORMWATER MANAGEMENT TO CONTROL THE RELEASE RATE OF THE 2 YEAR STORM EVENT HAS BEEN PROVIDED FOR THIS SITE DEVELOPMENT.

TYPICAL SECTION - ON-SITE PAVEMENT NO SCALE

4" TYPE 1 CRUSHED AGGREGATE SUBBASE COURSE  
REINFORCED WITH 4" x 4" x 1/2" REBAR

TYPICAL SECTION - LOADING DOCK PAD NO SCALE

WELDED WIRE MESH REINFORCEMENT  
4" x 4" x 1/2" REBAR  
8" CLASS AS CONCRETE

TYPICAL SECTION - PAVED DRIVEWAY NO SCALE

8" BILAMINOUS CONCRETE SURFACE COURSE  
8" BILAMINOUS CONCRETE BASE COURSE  
4" TYPE 1 CRUSHED AGGREGATE SUBBASE COURSE  
REINFORCED WITH 4" x 4" x 1/2" REBAR

NOTE: PAVEMENT DESIGN BASED ON ACCEPTABLE  
SCOURAGE PERMITTED IN ACCORDANCE WITH THE  
METHOD OF SURFACE EROSION AND  
GEOTECHNICAL ENGINEERING EVALUATION BY PER  
BASIS SEPTEMBER 2001.

**CA**

CANTRELL  
ALVARADO  
& ASSOCIATES, INC.  
Architecture  
Engineering  
Planning

**Baker**

Michael Baker Jr., Inc.

PROJECT TITLE

Virginia Department  
of Agriculture &  
Consumer Services

NORTHERN NECK  
FARMER'S  
MARKET

WESTMORELAND COUNTY  
VIRGINIA

REVISIONS

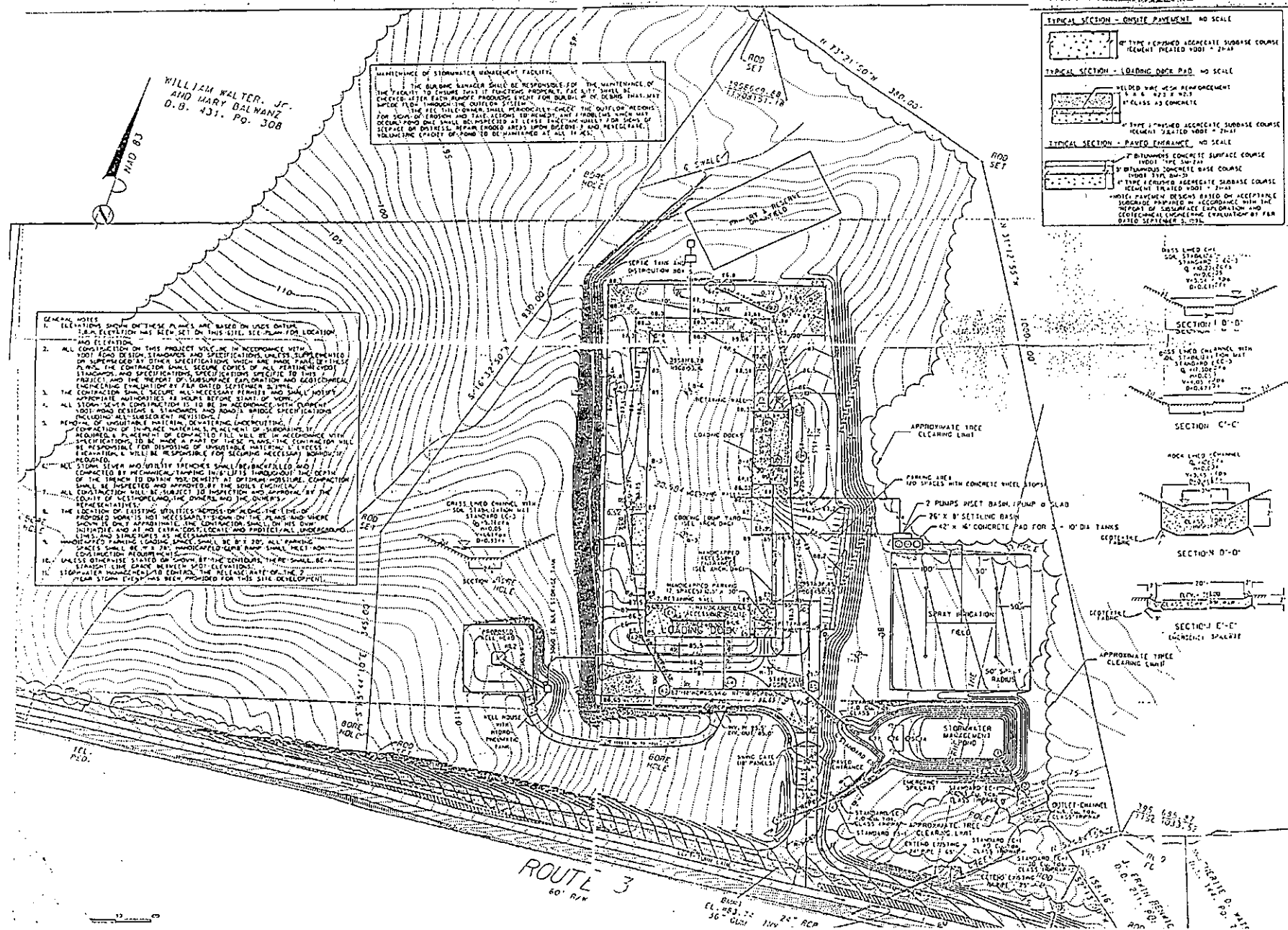
NO.	DATE	DESCRIPTION
1	06/10/2004	ISSUED FOR PERMIT
2	06/10/2004	ISSUED FOR PERMIT
3	06/10/2004	ISSUED FOR PERMIT
4	06/10/2004	ISSUED FOR PERMIT
5	06/10/2004	ISSUED FOR PERMIT
6	06/10/2004	ISSUED FOR PERMIT
7	06/10/2004	ISSUED FOR PERMIT
8	06/10/2004	ISSUED FOR PERMIT
9	06/10/2004	ISSUED FOR PERMIT
10	06/10/2004	ISSUED FOR PERMIT

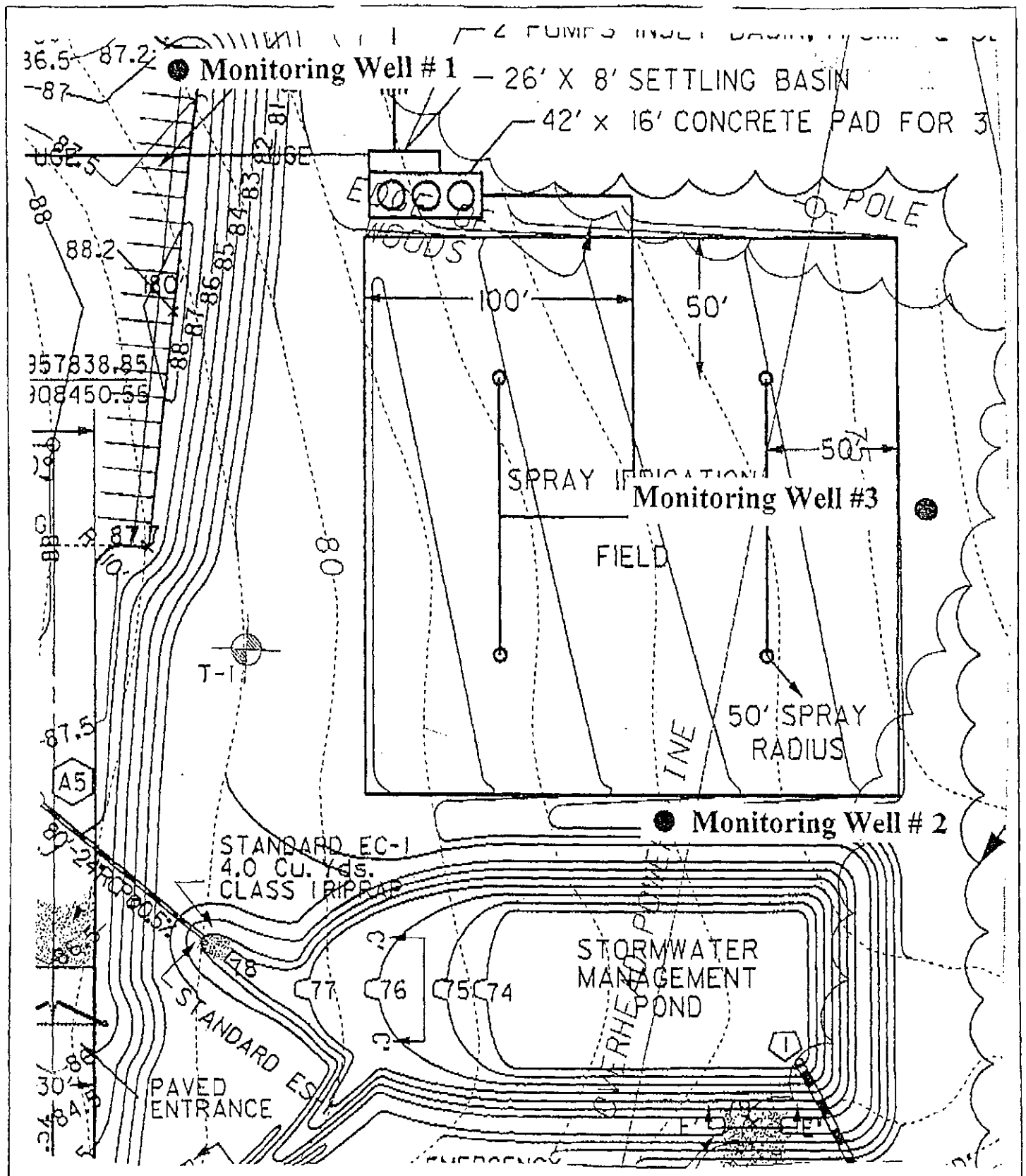
DATE

DRAWING TITLE

Site Plan

DRAWING NUMBER





Virginia Department of Agriculture and Consumer Services  
Northern Neck Farmers' Market

Westmoreland County, Virginia

**Figure 2**  
Monitoring Well Location

Scale = 1"=50'



**ATTACHMENT C.**

APPENDIX I-1  
TECHNICAL CHECKLIST REVIEW  
FORM FOR LAND APPLICATION  
INDUSTRIAL WASTE

PROJECT EVALUATION CHECKLIST

Project Name/Locations: Northern Neck Farmer's Market

Consultant(s)/Specialty: \_\_\_\_\_

Owner(s): Northern Neck Vegetable Grower's Assoc.

Date Received: \_\_\_\_\_ Date Reviewed: \_\_\_\_\_

Reviewer(s): JMM/MSG

If no, provide comments below that item.

**Part A.**

☒ Yes No Has the owner fully completed Part A of the application  
for a VPA Permit?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Supplied legal name and address?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Provided name and address of authorized agent?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Address/location map of the establishment?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Provided name, title, date, and signature on application?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Checked description of establishment and provides SIC  
code?

\_\_\_\_\_  
\_\_\_\_\_

☒ Yes No Checked appropriate description of facilities?

\_\_\_\_\_  
\_\_\_\_\_

- ☒ Yes ☐ No Provided a detailed, scaled layout of the establishment showing location of facilities in relation to any potential receiving waters?  
\_\_\_\_\_  
\_\_\_\_\_
- ☒ Yes ☐ No Provided a written description of the operation including unit treatment processes involved, storage facilities, etc.?  
\_\_\_\_\_  
\_\_\_\_\_
- ☒ Yes ☐ No Provided a block diagram illustrating the interrelationships of the described treatment, storage, disposal processes, including flows and/or quantities handled?  
\_\_\_\_\_  
\_\_\_\_\_
- Yes ☒ No For land treatment systems provided conceptual plans and specifications for transport, conveyance, and application of waste to the land?  
N/A for issuance  
\_\_\_\_\_
- Yes ☒ No Provided conceptual plans and specifications for all treatment works including scaled plan view of facilities, cross sectional drawings, appropriate elevations of side walls, inside/outside berm side slopes, and details of any proposed liners.  
N/A for issuance  
\_\_\_\_\_
- ☒ Yes ☐ No Provided a comprehensive water balance for the treatment works?  
OK with staff design check  
\_\_\_\_\_
- Part B.**  
☒ Yes ☐ No Have the following items been addressed on Part B of the application?  
as noted  
\_\_\_\_\_  
\_\_\_\_\_
- ☒ Yes ☐ No Has a representative, composite sample been obtained and analyzed for the minimum constituents in Part B?  
\_\_\_\_\_  
\_\_\_\_\_
- ☒ Yes ☐ No Has the waste been evaluated and designated by the owner as nonhazardous?  
\_\_\_\_\_  
\_\_\_\_\_

- ☒ Yes ☐ No For wastewater disposal systems, has monthly precipitation data, and monthly evapotranspiration data been provided and accompanied with pertinent references? (Data pertinent for systems exceeding 0.5 inches per week).  
~~added him to update rainfall info for 25 yr cycle~~  
 OK with staff design check
- 
- ☒ Yes ☐ No Selected crop(s)/grasses listed?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 
- Yes ☒ No Specific crop yields listed for the soils involved (with site specific documentation)?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 
- Yes ☒ No Planting/harvesting schedules provided to justify non-application periods?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 
- Yes ☐ No Have design calculations been provided to justify land area requirements for the following constituents accompanied with appropriate reference?  
*See attachment*
- \* nitrogen
  - \* oxygen demand (TOD)
  - \* oil and grease
  - \* phosphorus
  - \* potassium
  - \* sulfur
  - \* salts (both in balance and concentration)
  - \* anionic/mobile constituents (chlorides, sodium, etc.)
  - \* heavy metals (Cd, Zn, Pb, Ni, Cu, etc.)
- 
- 
- ☒ Yes ☐ No For heavy metals, does the land treatment design reflect a predetermined site life within the maximum cumulative **constraints** published in the land treatment guidelines?  
 \_\_\_\_\_  
 \_\_\_\_\_
- 
- ☒ Yes ☐ No Does the design ensure that the annual metal loading does not exceed 10 percent of the maximum cumulative loading?  
 \_\_\_\_\_  
 \_\_\_\_\_
-

(Yes) No Is a plan for crop disposition provided (eg. used for animal feed, erosion control, etc.)  
*grass left in the field after cutting -*

Yes No For Sludge application systems, has a complete sludge balance been provided showing the timing and quantity of sludge application in relation to the cropping plan and addition to and draw down from storage?  
*N/A*

(Yes) No For waste water systems (exceeding 0.5 in/wk) has an annual water balance been provided including a monthly accounting for precipitation, evapotranspiration, percolation, wastewater loading, and addition to and draw down from storage?  
*Not to be updated OK with staff design check*

**Part C**  
 (Yes) No Has the owner completed Part C of the Application for a VPA Permit by including the following information?

(Yes) No Submitted a scaled location map of the land treatment area detailing locations of pertinent soil samples, test pits, or hydrogeologic borings and test wells?  
*will update soil samples ✓*

(Yes) No Indicated the following physiographic features on the above map if within 0.25 mile of the site: water wells (operating or abandoned), surface waters, springs, public water supplies, sinkholes, occupied dwellings, surface impoundments, and landfill(s)?

(Yes) No Submitted a topographic map of the site of sufficient detail to clearly indicate slopes, depressions, drainage ways, and portions within the 100 year flood plain, the actual acreage to which waste will be applied, and the following buffers:

surface water courses:	50 ft.
water wells	50 ft.
other surface waters (lakes, ponds)	50 ft.
sink holes/rock outcrops	50 ft.

☒ Yes ☐ No Has total net acreage to which waste will be applied been computed accurately?

☒ Yes ☐ No Has a soil map been provided (USDA-SCS map if accessible) together with the requested general soil description for each major soil type?

☒ Yes ☐ No For wastewater systems (where water application exceeds 0.5 in/wk) have shallow soil borings been conducted for each major soil type to confirm the general soil information provided by the USDA-SCS Soil Survey Map including the following characteristics:

*with  
permit  
issuance*

Soil horizon identification with respect to texture and color

Depth to rock

Presence of fragipan or other restrictive layer

Depth to gray mottling

Presence of free water

Infiltration rates (testing required)

Subsoil permeability (testing required)

☒ Yes ☐ No Have statistically representative background soil samples been obtained for each major soil type and analyzed for the following minimum constituents: soil pH, CEC, available phosphorus, exchangeable potassium?

*to be submitted*

Yes No Have background soil samples been obtained and analyzed for those constituents deemed to, be of regulatory concern by the staff (heavy metals, exchangeable sodium percentage, other pertinent constituents)?

to be submitted

---

(Yes) No Has a ground water monitoring plan been submitted which provides the technical justification for up gradient and down gradient monitoring wells including:

Impact of perched or seasonal high water tables on well screen range and depth

Direction of localized ground water flow patterns evaluated

Assurance that both up gradient and down gradient wells are within the same geologic formation

Specifications for monitoring well construction provided including proposed screen elevations, materials used, size of pipe, grouting and provisions for security (well cap).

---

(Yes) No Does the proposed operation adequately address additional site monitoring, if needed?

NA plant tissue testing/yield

OK soil testing

NA surface water testing

---

**ATTACHMENT D.**

# VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

## Piedmont Regional Office WASTEWATER FACILITY INSPECTION REPORT

<b>FACILITY NAME:</b>	<u>Northern Neck Farmer's Market</u>	<b>INSPECTOR:</b>	<u>Mike Dare</u> MD 2-19-08
<b>PERMIT No.:</b>	<u>VPA01422</u>	<b>INSPECTION DATE:</b>	<u>February 7, 2008</u>
<b>TYPE OF FACILITY:</b>	<u>Industrial - No Discharge</u>	<b>REPORT COMPLETED:</b>	<u>February 19, 2008</u>
<b>COUNTY/CITY:</b>	<u>Westmoreland</u>	<b>UNANNOUNCED INSP.:</b>	<u>YES</u>
<b>REVIEWED BY:</b>	<i>John R. Stutz</i> 2/19/08		
<b>PRESENT DURING INSPECTION:</b>	<u>Mr. Jimmy Carter; spoke w/ Mr. Matthew Green by phone subsequent to insp.</u>		

### I. OPERATIONAL UNIT REVIEW AND CONDITION:

The Northern Neck Farmer's Market consists of areas for vegetable: receiving, washing, cooling, packaging and shipping.

**Floor/Area Drains:** Throughout the above mentioned areas is a system of floor and area drains designed to collect the runoff from vegetable washing and cooling operations. Additionally, the drains collect water used in the cleaning of equipment. Some drains reportedly receive stormwater.

**Settling Basin:** Wastewater collected in floor and area drains is piped to a four chamber, in series, concrete settling basin.

**Storage Tanks:** The wastewater is pumped from the final chamber in the settling basin to three 6,000-gallon storage tanks.

**Spray Irrigation Field:** The wastewater is pumped from the storage tanks through four spray nozzles to the one-acre spray irrigation field. The field had excellent grass cover.

### II. COMMENTS:

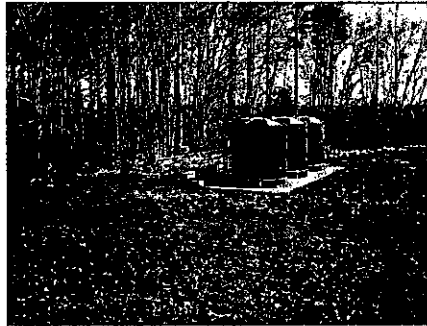
Sampling and analysis of the three on-site groundwater monitoring wells is performed the required two times a year by Mid-Atlantic Laboratories, Inc. This same lab performs the required annual soil and effluent sampling and analysis.

At the time of inspection, wastewater was discharging from a pipe located near the top of the settling basin to an adjacent wetland area at the rate of approximately 5 gallons per minute. No pumping was taking place from the settling basin to the storage tanks. It was subsequently reported by Mr. Green that this is the manner in which the system is operated during the winter months when vegetables are not being received. (See IV. Compliance Recommendations/Request for Corrective Action.)

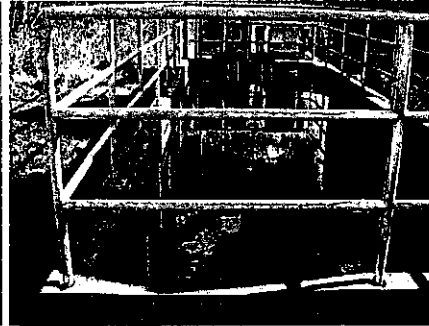
Wastewater Facility Inspection Report



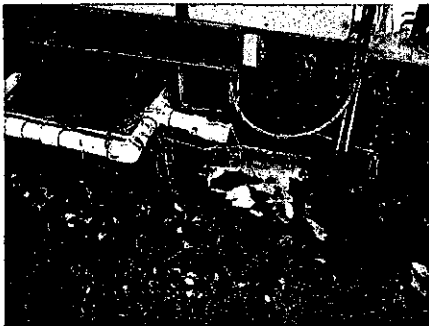
One-acre spray irrigation field



Settling basin and storage tanks



Settling basin



Discharge from basin to wetland



Adjacent Wetland



Equipment being pressure washed

**III. GENERAL RECOMMENDATIONS:**

1. None at this time.

**IV. COMPLIANCE RECOMMENDATIONS/REQUEST FOR CORRECTIVE ACTION:**

1. At the end of the vegetable washing season, once all wastewater has been applied to the spray irrigation field and all solids removed from the settling basin, it is acceptable to the DEQ that stormwater be allowed to discharge directly from the settling basin. However, any wastewater generated by the cleaning of equipment (such as in the photo above) must flow through the settling basin and be applied to the spray irrigation field as this flow could potentially contain detergents, pesticides and solids.
2. Ensure that both the stormwater discharge procedure and spray irrigation of wastewater generated by the cleaning of equipment procedure - discussed in item no. 1 above - are included in the facility's Operations and Maintenance Manual.
3. The application for the reissuance of this permit was two months overdue at the time of this inspection. Please submit this application as soon as possible. The application should be updated to include the additional source of waste that is generated by the cleaning of equipment.

**Copies:** DEQ – PRO File  
Mr. Matthew Green

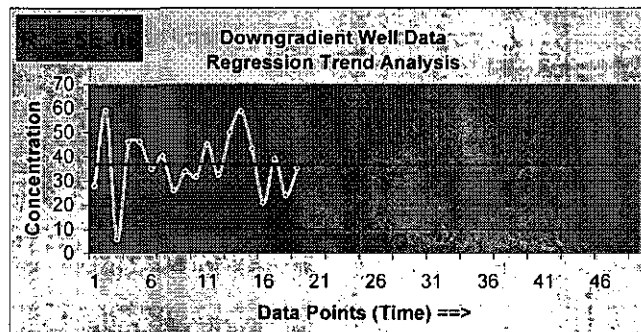
**ATTACHMENT E.**

Northern Neck Farmer's Market VPA01422 Groundwater Analysis 1998-2008						
	MW-2 (downgradient) compared to MW-1 (upgradient)			MW-3 (downgradient) compared to MW-1 (upgradient)		
Parameter	Normal Distribution?	Significant difference?	Trend (in MW-2)	Normal Distribution?	Significant difference?	Trend (in MW-3)
Chloride	No	Yes	Flat	Yes	No	Upward
Nitrate	Yes	No	Downward	No	Yes	Upward
TDS	No	Yes	Flat	No	Yes	Downward
Sulfate	Yes	No	Downward	Yes	No	Downward
TKN	No	Yes	Downward	No	Yes	Downward
TOC	No	Yes	Downward	No	No	Downward
pH	No	No	Sl. Upward	No	No	Sl. Upward

- The data were entered into a program to determine Kolmogorov-Smirnov Goodness of Fit for Continuous Data at a 5% Level of Significance to see whether the distribution was normal or non-normal. If the data were normal, a T-test determined if there was a significant difference between the upgradient and downgradient well data. If the data distribution was non-normal, a non-parametric test determined if there was a significant difference between the upgradient and downgradient well data.
- The increases compared to the upgradient well for chloride (MW-2), nitrate (MW-3), and TKN for both are very small. TOC at MW-2 showed a significant increase compared to the upgradient well, but the overall trend was downward.
- MW-3 Well Data for nitrate showed an upward trend over time and a significant difference compared to the upgradient well. Prior to June, 2003, the data at MW-3 were less than the upgradient well data. From June, 2003, the data were the same or exceeded the upgradient well data. When MW-3 data from June, 2003 and MW-1 data from the same time period were compared, a Normal Distribution was obtained that showed a significant increase compared to MW-1. However, the MW-3 data from this time period show a downward trend from 2003 to present.
- MW-2 Well TDS data showed a significant difference compared to the upgradient well MW-1 according to the non-normal parametric test. Sodium, a component of TDS, is being added to the wastewater monitoring to track its application over time.
- The owner is being requested to submit a corrective action plan to address these groundwater changes. DEQ staff anticipate that improved site management and a check of the well integrity, with repairs as necessary, may address these conditions sufficiently over time.

[illegible]

Facility Name:	Northern Neck Farmer's Market
Permit Number:	VPA01422
Parameter:	Chloride
Monitoring Well #:	2, compared to 1



# Groundwater Data Analysis for Non-normal Data

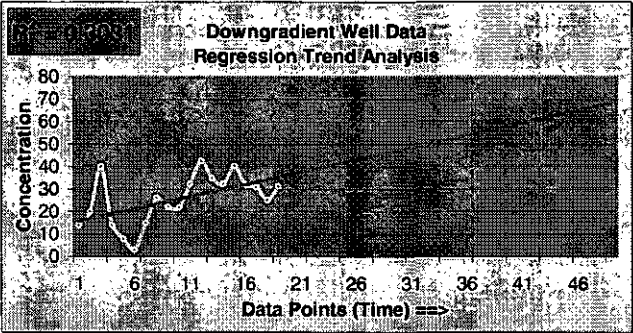
Parameter	Chloride
Up Gradient Data	Down Gradient Data
30	28
55	59
47	6
53	46
44	46
33	35
29	40
21	26
15.9	33.7
17.2	31.5
25	45
28.74	32.48
37.48	49.98
26.24	58.73
21	43.1
14	21
24	39
15.8	23.8
17.8	35
Minimum 14	Minimum 6
Maximum 55	Maximum 59
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Notthem Neck Farmers Ma
Parameter	Chloride
Monitoring Well #	2 compared to 1

Kolmogorov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Downgradient Data	Background Data
	14	30
	20	55
	40	47
	14	53
	8	44
	9	33
	15	29
	26	21
	22	15.9
	21.7	17.2
	32.49	25
	42.48	28.74
	34.98	37.48
	32.48	26.24
	40.3	21
	32	14
	31	24
	25.1	15.8
	31.3	17.8
Data is normally distributed. Use T-Test.		
# Observations	19	19
Max.	42.48	

Facility Name:	Notthern Neck Farmer's Market
Permit Number:	VPA01422
Parameter:	Chloride
Monitoring Well #:	3, compared to 1

All data must be in number format, without any greater than(>) or less than (<) signs.



This Regression Trend Analysis should only be used if the data are entered in chronological order. This means oldest data at the top and newest data at the bottom of the Downgradient Data column.

Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

Permit Number

Facility Name

Parameter

Monitoring Well #:

What is the number of observations in the set of background data ( $n_b$ )?

What is the number of observations in the set of monitoring data ( $n_m$ )?

VPA01422  
Northern Neck Farmer's Market  
Chloride  
3, compared to 1  
19  
19

	Background	Monitored Site	$[X_b - X_b(ave)]^2$	$[X_m - X_m(ave)]^2$
1	30	14	0.610	133.865
2	55	20	664.663	31.025
3	47	40	316.166	208.225
4	53	14	565.538	133.865
5	44	8	218.480	308.705
6	33	3	14.296	509.405
7	29	15	0.048	111.725
8	21	26	67.551	0.185
9	15.9	22	177.394	12.745
10	17.2	21.7	144.455	14.977
11	25	32.49	17.500	47.886
12	28.74	42.48	0.229	285.548
13	37.48	34.98	68.245	88.548
14	26.24	32.48	8.874	47.748
15	21	40.3	67.551	216.973
16	14	32	231.616	41.345
17	24	31	27.237	29.485
18	15.8	25.1	180.068	0.221
19	17.8	31.3	130.392	32.833
20	0	0	0.000	0.000
21	0	0	0.000	0.000
22	0	0	0.000	0.000
23	0	0	0.000	0.000
24	0	0	0.000	0.000
25	0	0	0.000	0.000
26	0	0	0.000	0.000
27	0	0	0.000	0.000
28	0	0	0.000	0.000
29	0	0	0.000	0.000
30	0	0	0.000	0.000
31	0	0	0.000	0.000
32	0	0	0.000	0.000
33	0	0	0.000	0.000
34	0	0	0.000	0.000
35	0	0	0.000	0.000
36	0	0	0.000	0.000
37	0	0	0.000	0.000
38	0	0	0.000	0.000
39	0	0	0.000	0.000
40	0	0	0.000	0.000

$$X_b(ave) = 29.219 \quad X_m(ave) = 25.570$$

$$T_b = 1.734 \quad (\text{from lookup table})$$

$$T_m = 1.734$$

$$s_b^2 = 161.179 = [(X_{b1} - X_b(ave))^2 + (X_{b2} - X_b(ave))^2 + \dots + (X_{bn} - X_b(ave))^2] / (n_b - 1)$$

$$s_m^2 = 125.317 = [(X_{m1} - X_m(ave))^2 + (X_{m2} - X_m(ave))^2 + \dots + (X_{mn} - X_m(ave))^2] / (n_m - 1)$$

$$T_{star} = -0.940 = [X_m(ave) - X_b(ave)] / \sqrt{s_m^2/n_m + s_b^2/n_b}$$

$$W_b = 8.483 = s_b^2/n_b$$

$$W_m = 6.596 = s_m^2/n_m$$

$$T_{comp} = 1.734 = (W_b \cdot T_b + W_m \cdot T_m) / (W_b + W_m)$$

**There is no significant difference between the monitoring data and the background data or there is a failure of the assumption made for test validity**



Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

Permit Number

Facility Name

Parameter

Monitoring Well #:

What is the number of observations in the set of background data ( $n_b$ )?

What is the number of observations in the set of monitoring data ( $n_m$ )?

VPA01422

Northern Neck Farmers Market

nitrate

2 compared to 1

19

19

	Background	Monitored Site	$[X_b - X_b(\text{ave})]^2$	$[X_m - X_m(\text{ave})]^2$
1	8.4	9.4	15.874	17.995
2	11.7	0.3	53.060	23.599
3	12.2	6.3	60.594	9.873
4	10.9	4.5	42.045	0.433
5	9.7	4.2	27.923	0.918
6	3.3	4.9	1.245	0.067
7	6.9	5.97	6.171	0.660
8	3.1	4.8	1.731	0.128
9	3.66	8.11	0.571	8.715
10	2	3.2	5.836	3.833
11	0.8	3.6	13.074	2.427
12	5.2	8.4	0.615	10.511
13	1.6	4	7.929	1.341
14	3.2	5.6	1.478	0.195
15	0.44	6.58	15.807	2.022
16	0.3	3.5	16.940	2.749
17	0.2	5	17.773	0.025
18	0.184	2.41	17.908	7.551
19	0.116	5.23	18.488	0.005
20	0	0	0.000	0.000
21	0	0	0.000	0.000
22	0	0	0.000	0.000
23	0	0	0.000	0.000
24	0	0	0.000	0.000
25	0	0	0.000	0.000
26	0	0	0.000	0.000
27	0	0	0.000	0.000
28	0	0	0.000	0.000
29	0	0	0.000	0.000
30	0	0	0.000	0.000
31	0	0	0.000	0.000
32	0	0	0.000	0.000
33	0	0	0.000	0.000
34	0	0	0.000	0.000
35	0	0	0.000	0.000
36	0	0	0.000	0.000
37	0	0	0.000	0.000
38	0	0	0.000	0.000
39	0	0	0.000	0.000
40	0	0	0.000	0.000

$$X_b(\text{ave}) = 4.416 \quad X_m(\text{ave}) = 5.158$$

$$T_b = 1.734 \quad (\text{from lookup table})$$

$$T_m = 1.734$$

$$s_b^2 = 18.059 = [(X_{b1} - X_b(\text{ave}))^2 + (X_{b2} - X_b(\text{ave}))^2 + \dots + (X_{bn} - X_b(\text{ave}))^2] / (n_b - 1)$$

$$s_m^2 = 5.169 = [(X_{m1} - X_m(\text{ave}))^2 + (X_{m2} - X_m(\text{ave}))^2 + \dots + (X_{mn} - X_m(\text{ave}))^2] / (n_m - 1)$$

$$T_{\text{stat}} = 0.671 = [X_m(\text{ave}) - X_b(\text{ave})] / \sqrt{s_m^2 / n_m + s_b^2 / n_b}$$

$$W_b = 0.950 = s_b^2 / n_b$$

$$W_m = 0.272 = s_m^2 / n_m$$

$$T_{\text{comp}} = 1.734 = (W_b \cdot T_b + W_m \cdot T_m) / (W_b + W_m)$$

**There is no significant difference between the monitoring data and the background data**



## Groundwater Data Analysis for Non-normal Data

Parameter	nitrate
Up Gradient Data	Down Gradient Data
8.4	2.7
11.7	0.2
12.2	8.7
10.9	0.1
9.7	0.1
3.3	0.23
6.9	0.1
3.1	1.2
3.66	0.58
2	1.6
0.8	0.8
5.2	7.2
1.6	13.2
3.2	4.4
0.44	5.22
0.3	2.9
0.2	2.7
0.184	1.93
0.116	2.62
Minimum 0.116	Minimum 0.1
Maximum 12.2	Maximum 13.2
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Northern Neck Farmer's Market
Parameter	nitrate
Monitoring Well #:	3, compared to 1



Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

Permit Number

Facility Name

Parameter

Monitoring Well #:

What is the number of observations in the set of background data ( $n_b$ )?

What is the number of observations in the set of monitoring data ( $n_m$ )?

VPA01422

Nottingham Neck Farmer's Market

nitrate

3, compared to 1

9

9

	Background	Monitored Site	$[X_b - X_b(\text{ave})]^2$	$[X_m - X_m(\text{ave})]^2$
1	0.8	0.8	0.289	14.004
2	5.2	7.2	14.917	7.064
3	1.6	13.2	0.069	74.957
4	3.2	4.4	3.468	0.020
5	0.44	5.22	0.806	0.459
6	0.3	2.9	1.077	2.697
7	0.2	2.7	1.295	3.394
8	0.194	1.93	1.331	5.824
9	0.116	2.53	1.493	4.049
10	0	0	0.000	0.000
11	0	0	0.000	0.000
12	0	0	0.000	0.000
13	0	0	0.000	0.000
14	0	0	0.000	0.000
15	0	0	0.000	0.000
16	0	0	0.000	0.000
17	0	0	0.000	0.000
18	0	0	0.000	0.000
19	0	0	0.000	0.000
20	0	0	0.000	0.000
21	0	0	0.000	0.000
22	0	0	0.000	0.000
23	0	0	0.000	0.000
24	0	0	0.000	0.000
25	0	0	0.000	0.000
26	0	0	0.000	0.000
27	0	0	0.000	0.000
28	0	0	0.000	0.000
29	0	0	0.000	0.000
30	0	0	0.000	0.000
31	0	0	0.000	0.000
32	0	0	0.000	0.000
33	0	0	0.000	0.000
34	0	0	0.000	0.000
35	0	0	0.000	0.000
36	0	0	0.000	0.000
37	0	0	0.000	0.000
38	0	0	0.000	0.000
39	0	0	0.000	0.000
40	0	0	0.000	0.000

$$X_b(\text{ave}) = 1.338 \quad X_m(\text{ave}) = 4.542$$

$$T_b = 1.86 \quad (\text{from lookup table})$$

$$T_m = 1.86$$

$$s_b^2 = 3.093 = [(X_{b1} - X_b(\text{ave}))^2 + (X_{b2} - X_b(\text{ave}))^2 + \dots + (X_{bn} - X_b(\text{ave}))^2] / (n_b - 1)$$

$$s_m^2 = 14.184 = [(X_{m1} - X_m(\text{ave}))^2 + (X_{m2} - X_m(\text{ave}))^2 + \dots + (X_{mn} - X_m(\text{ave}))^2] / (n_m - 1)$$

$$T_{\text{stat}} = 2.313 = [X_m(\text{ave}) - X_b(\text{ave})] / \sqrt{(s_m^2/n_m + s_b^2/n_b)}$$

$$W_b = 0.344 = s_b^2/n_b$$

$$W_m = 1.576 = s_m^2/n_m$$

$$T_{\text{comp}} = 1.86 = (W_b \cdot T_b + W_m \cdot T_m) / (W_b + W_m)$$

There is a significant increase in this parameter



# Groundwater Data Analysis for Non-normal Data

Parameter	TDS
Up Gradient Data	Down Gradient Data
230	300
164	182
221	195
216	81
166	143
84	78
48	124
126	185
78	148
76	158
40	140
252	836
80	160
88	110
122	214
68	82
184	220
126	100
150	166
Minimum 40	Minimum 78
Maximum 252	Maximum 836
Is there a significant difference?	
YES	

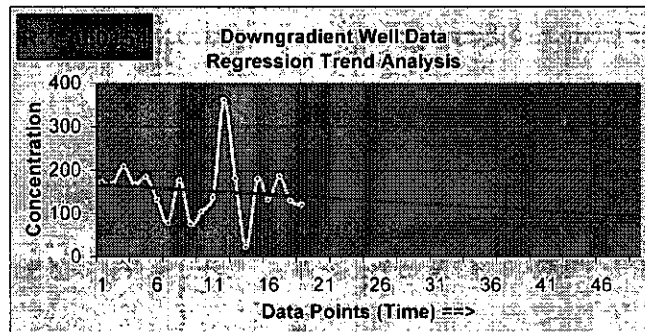
Permit Number	VPA01422
Facility Name	Notthern Neck Farmers M
Parameter	TDS
Monitoring Well #	2, compared to 1

Kolmogorov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Downgradient Data	Background Data
	172	230
	168	164
	208	221
	166	216
	184	166
	132	84
	78	48
	176	126
	75	78
	104	76
	136	40
	360	252
	180	80
	22	88
	180	122
	132	168
	185	184
	130	126
	120	150
# Observations	19	19
	360	

Data is NOT normally distributed. Use Non-Parametric Test

Facility Name:	Notthem Neck Farmer's Market
Permit Number:	VPA01422
Parameter:	TDS
Monitoring Well #:	3, compared to 1

All data must be in number format, without any greater than(>) or less than(<) signs.



This Regression Trend Analysis should only be used if the data are entered in chronological order. This means oldest data at the top and newest data at the bottom of the Downgradient Data column.

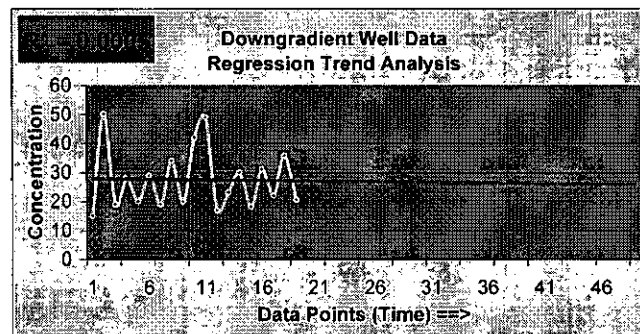
# Groundwater Data Analysis for Non-normal Data

Parameter	TDS
Up Gradient Data	Down Gradient Data
230	172
164	168
221	208
216	166
166	184
84	132
48	78
126	176
78	75
76	104
40	136
252	360
80	180
88	22
122	180
68	132
184	185
126	130
150	120
Minimum 40	Minimum 22
Maximum 252	Maximum 360
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Nothern Neck Farmer's M
Parameter	TDS
Monitoring Well #	3, compared to 1

[illegible]

Facility Name:	Notthorn Neck Farmer's Market	
Permit Number:	VPA01422	
Parameter:	Sulfate	
Monitoring Well #:	2, compared to 1	



Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

Permit Number

Facility Name

Parameter

Monitoring Well #:

What is the number of observations in the set of background data ( $n_b$ )?

What is the number of observations in the set of monitoring data ( $n_m$ )?

VPA01422

Northern Neck Farmers Market

Sulfate

2, compared to 1

19

19

	Background	Monitored Site	$[X_b - X_b(\text{ave})]^2$	$[X_m - X_m(\text{ave})]^2$
1	12	15	82.294	156.066
2	5	50	258.296	506.582
3	5	19	258.296	72.125
4	8	28	170.866	0.257
5	6	20	227.152	56.140
6	9	29	145.723	2.272
7	12	19	82.294	72.125
8	16	34	25.721	42.346
9	20.4	19.9	0.451	57.648
10	28	42	48.003	210.464
11	28	49	48.003	462.567
12	18	17	9.435	110.095
13	31.99	23.04	119.212	19.826
14	43.67	29.92	510.689	5.892
15	28.7	18.2	58.193	86.353
16	33	31	142.287	12.302
17	39	22	321.428	30.169
18	22	35.8	0.862	69.012
19	34.6	20.5	183.018	48.897
20	0	0	0.000	0.000
21	0	0	0.000	0.000
22	0	0	0.000	0.000
23	0	0	0.000	0.000
24	0	0	0.000	0.000
25	0	0	0.000	0.000
26	0	0	0.000	0.000
27	0	0	0.000	0.000
28	0	0	0.000	0.000
29	0	0	0.000	0.000
30	0	0	0.000	0.000
31	0	0	0.000	0.000
32	0	0	0.000	0.000
33	0	0	0.000	0.000
34	0	0	0.000	0.000
35	0	0	0.000	0.000
36	0	0	0.000	0.000
37	0	0	0.000	0.000
38	0	0	0.000	0.000
39	0	0	0.000	0.000
40	0	0	0.000	0.000

$$X_b(\text{ave}) = 21.072 \quad X_m(\text{ave}) = 27.493$$

$$T_b = 1.734 \quad (\text{from lookup table})$$

$$T_m = 1.734$$

$$s_b^2 = 149.568 = [(X_{b1} - X_b(\text{ave}))^2 + (X_{b2} - X_b(\text{ave}))^2 + \dots + (X_{bn} - X_b(\text{ave}))^2] / (n_b - 1)$$

$$s_m^2 = 112.285 = [(X_{m1} - X_m(\text{ave}))^2 + (X_{m2} - X_m(\text{ave}))^2 + \dots + (X_{mn} - X_m(\text{ave}))^2] / (n_m - 1)$$

$$T_{\text{star}} = 1.730 = [X_m(\text{ave}) - X_b(\text{ave})] / \sqrt{(s_m^2/n_m + s_b^2/n_b)}$$

$$W_b = 7.872 = s_b^2/n_b$$

$$W_m = 5.910 = s_m^2/n_m$$

$$T_{\text{comp}} = 1.734 = (W_b \cdot T_b + W_m \cdot T_m) / (W_b + W_m)$$

There is no significant difference between the monitoring data and the background data



Cochran's Approximation to the Behrens-Fisher Student's t-Test (at a 5% Level of Significance)

Permit Number

Facility Name

Parameter

Monitoring Well #:

What is the number of observations in the set of background data ( $n_b$ )?

What is the number of observations in the set of monitoring data ( $n_m$ )?

VFA01422

Northern Neck Farmers Market

Sulfate

3, compared to 1

19

	Background	Monitored Site	$[X_b - X_b(\text{ave})]^2$	$[X_m - X_m(\text{ave})]^2$
1	12	27	95.999	8.765
2	5	20	282.169	16.317
3	5	25	282.169	0.923
4	8	29	190.382	24.607
5	6	15	249.573	81.712
6	9	39	163.786	223.817
7	12	12	95.999	144.949
8	16	52	33.616	781.791
9	20.4	35	1.954	120.133
10	28	36.5	38.466	155.265
11	28	30	38.466	35.528
12	18	15	14.424	81.712
13	31.99	15.1	103.879	79.914
14	43.67	18.35	478.389	32.370
15	28.7	12.4	47.639	135.477
16	33	21	125.487	9.238
17	39	16	295.912	64.633
18	35.8	22	196.059	4.159
19	34.6	15.4	163.894	58.362
20	0	0	0.000	0.000
21	0	0	0.000	0.000
22	0	0	0.000	0.000
23	0	0	0.000	0.000
24	0	0	0.000	0.000
25	0	0	0.000	0.000
26	0	0	0.000	0.000
27	0	0	0.000	0.000
28	0	0	0.000	0.000
29	0	0	0.000	0.000
30	0	0	0.000	0.000
31	0	0	0.000	0.000
32	0	0	0.000	0.000
33	0	0	0.000	0.000
34	0	0	0.000	0.000
35	0	0	0.000	0.000
36	0	0	0.000	0.000
37	0	0	0.000	0.000
38	0	0	0.000	0.000
39	0	0	0.000	0.000
40	0	0	0.000	0.000

$$X_b(\text{ave}) = 21.798 \quad X_m(\text{ave}) = 24.039$$

$$T_b = 1.734 \quad (\text{from lookup table})$$

$$T_m = 1.734$$

$$s_b^2 = 161.015 = [(X_{b1} - X_b(\text{ave}))^2 + (X_{b2} - X_b(\text{ave}))^2 + \dots + (X_{bn} - X_b(\text{ave}))^2] / (n_b - 1)$$

$$s_m^2 = 114.426 = [(X_{m1} - X_m(\text{ave}))^2 + (X_{m2} - X_m(\text{ave}))^2 + \dots + (X_{mn} - X_m(\text{ave}))^2] / (n_m - 1)$$

$$T_{stat} = 0.589 = [X_m(\text{ave}) - X_b(\text{ave})] / \sqrt{s_m^2/n_m + s_b^2/n_b}$$

$$W_b = 8.474 = s_b^2/n_b$$

$$W_m = 6.022 = s_m^2/n_m$$

$$T_{comp} = 1.734 = (W_b \cdot T_b + W_m \cdot T_m) / (W_b + W_m)$$

There is no significant difference between the monitoring data and the background data



## Groundwater Data Analysis for Non-normal Data

Parameter	TKN
Up Gradient Data	Down Gradient Data
1.3	1.4
0.2	2.9
0.1	1.3
0.2	0.9
0.1	0.2
0.1	0.2
0.1	0.6
0.8	0.2
0.5	0.6
2.9	4.4
0.11	0.06
0.27	0.4
0.11	0.06
0.41	0.47
0.13	0.16
0.51	0.18
1.45	2.09
0.7	0.7
2.4	1.4
Minimum 0.1	Minimum 0.06
Maximum 2.9	Maximum 4.4
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Notthern Neck Farmers Ma
Parameter	TKN
Monitoring Well #	2, compared to 1



# Groundwater Data Analysis for Non-normal Data

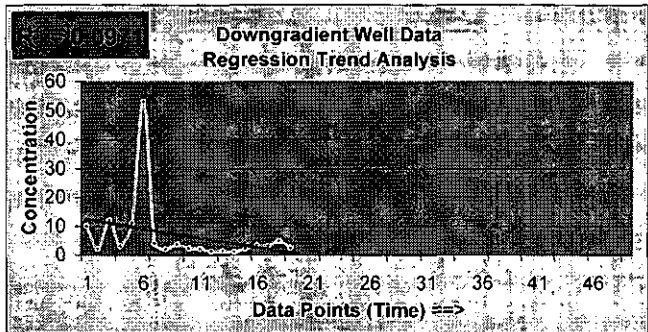
Parameter	TKN
Up Gradient Data	Down Gradient Data
1.3	1.2
0.2	1.1
0.1	1.7
0.2	0.9
0.1	1.3
0.1	1.5
0.8	0.9
0.5	5.6
2.9	2.7
0.27	0.3
0.11	0.07
0.41	0.17
0.13	0.21
0.51	0.47
1.45	5.22
0.7	0.5
2.4	0.7
0.999	0.419
0.37	0.488
Minimum	Minimum
0.1	0.07
Maximum	Maximum
2.9	5.6
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Notthern Neck Farmers Market
Parameter	TKN
Monitoring Well #	3, compared to 1

Kolmogorov-Smirnov Goodness of Fit Test for Continuous Data - 5% Level of Significance	Downgradient Data	Background Data
	10	13
	2	2
	12	2
	3	2
	11	7
	53	10
	4	2
	2	8
	3.67	1.67
	2.33	1.59
	2.05	1.6
	1.27	2.41
	1.4	2
	1	1
	2.22	1.86
	3.3	6.5
	3	2.8
	4.76	3.92
	2.44	3.06
Data is NOT normally distributed. Use Non-Parametric Test		
# Observations	19	19
Max.	53	

Facility Name:	Notthern Neck Farmer's Market
Permit Number:	VPA01422
Parameter:	TOC
Monitoring Well #:	2, compared to 1

All data must be in number format, without any greater than(>) or less than (<) signs.



This Regression Trend Analysis should only be used if the data are entered in chronological order. This means oldest data at the top and newest data at the bottom of the Downgradient Data column.

# Groundwater Data Analysis for Non-normal Data

Parameter	TOC
Up Gradient Data	Down Gradient Data
13	10
2	2
2	12
2	3
7	11
10	53
2	4
8	2
1.67	3.67
1.59	2.33
1.6	2.05
2.41	1.27
2	1.4
1	1
1.86	2.22
6.5	3.3
2.8	3
3.92	4.76
3.06	2.44
Minimum 1	Minimum 1
Maximum 13	Maximum 53
Is there a significant difference?	
YES	

Permit Number	VPA01422
Facility Name	Northern Neck Farmers Market
Parameter	TOC
Monitoring Well #	2 compared to 1



# Groundwater Data Analysis for Non-normal Data

Parameter	TOC
Up Gradient Data	Down Gradient Data
13	4
2	5
2	3
2	3
7	7
10	3
2	4
8	3
1.67	3.53
1.59	2.14
1.6	1.88
2.41	2.04
2	2.4
1	1
1.86	1.15
6.5	3.7
2.8	2.4
3.92	3.38
3.06	1.23
Minimum 1	Minimum 1
Maximum 13	Maximum 7
Is there a significant difference?	
NO	

Permit Number	VPA01422
Facility Name	Northern Neck Farmer's Ma
Parameter	TOC
Monitoring Well #	3, compared to 1



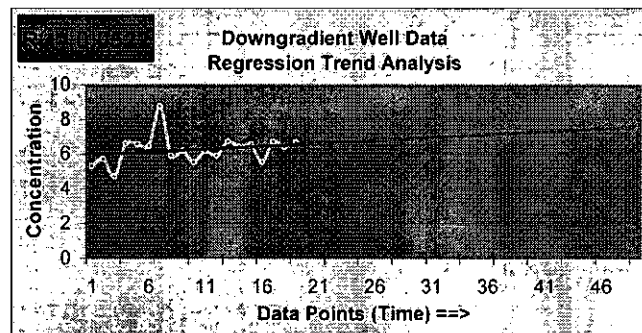
## Groundwater Data Analysis for Non-normal Data

Parameter	pH
Up Gradient Data	Down Gradient Data
4.6	4.5
5	4.8
4	7.1
4.1	4.8
4.32	4.76
4.7	4.5
10.98	9.15
4.26	4.81
4.6	4.92
5.06	4.69
6.18	5.24
5.91	6.01
6.18	6.13
5.34	5.54
4.73	4.67
5.11	5.89
6.1	6.3
5.61	5.72
6.21	6.34
Minimum 4	Minimum 4.5
Maximum 10.98	Maximum 9.15
Is there a significant difference?	
Lower Range	Upper Range
No	No

Permit Number	VPA01422
Facility Name	Northern Neck Farmers Ma
Parameter	pH
Monitoring Well #	2, compared to 1

[illegible]

Facility Name:	Northern Neck Farmer's Market	
Permit Number:	VPA01422	
Parameter:	pH	
Monitoring Well #:	3, compared to 1	



## Groundwater Data Analysis for Non-normal Data

Parameter	pH
<b>Up Gradient Data</b>	<b>Down Gradient Data</b>
4.6	5.3
5	5.7
4	4.7
4.1	6.6
4.32	6.56
4.7	6.47
10.98	8.75
4.26	5.89
4.6	6.19
5.06	5.53
6.18	6.17
5.91	5.89
6.18	6.72
5.34	6.41
4.73	6.53
5.11	5.53
6.1	6.7
5.61	6.4
6.21	6.67
Minimum 4	Minimum 4.7
Maximum 10.98	Maximum 8.75
<b>Is there a significant difference?</b>	
<b>Lower Range</b>	<b>Upper Range</b>
<b>No</b>	<b>No</b>

Permit Number	VPA01422
Facility Name	Northern Neck Farmer's Market
Parameter	pH
Monitoring Well #:	3 compared to 1

## **ATTACHMENT F**

75-006

**APPENDIX III -- VPA PERMIT PAGES**

**III F. Attachment B-1 Recommended PAN Rates**

**Attachment B-1  
Table I**

**Recommended Plant Available Nitrogen (PAN) Application Rates in pounds of Nitrogen (N) per acre for Various Non-Irrigated Crops Used in Sludge Management Systems (1)**

Crop	Soil Productivity Group									
	I		II		III		IV		V	
	A	B	A	B	A	B	A	B		
	_____ lbs N/acre _____									
Corn grain or silage	160 to 180	150 to 170	140 to 160	130 to 150	120 to 140	110 to 130	100 to 120	85 to 105	65 to 85	
Grain sorghum	140	130	120	110	100	95	90		80	
Full Season Soybeans (2)	160 to 180	150 to 170	140 to 160	130 to 150	120 to 140	110 to 130	100 to 120	85 to 105	65 to 85	
Canola (3)	100		90		80		60		60	
Wheat	100		90		80		60		60	
Barley	90		80		80		60		60	
Rye	75		75		75		75		75	
Oats	80		80		80		60		60	
Tallgrass hay (4)	250		250		200		160		160	
Bermudagrass hay	300		300		260		210		210	
Pasture Fescue/Orchardgrass(5)	120		120		100		80		80	
Bermudagrass pasture	200		200		160		120		120	
Alfalfa	300		300		210		150		150	
Sudangrass, sudan-sorghum, millet (6)	70		70		70		70		70	
Stockpiled tall fescue (summer application by August 31)	90		90		90		60		60	

**Notes:** (1) For proposed use of crops or PAN rates (lbs/A) not included in the following tables, adequate yield and PAN Data are to be submitted for staff approval prior to land application.

(2) For double crop or late beans planted after 6/21, (of any year,) allowable PAN rates are the lowest of the listed values, as rounded to nearest factor of ten.

(3) For fall application rate, may sidedress up to 60 lbs fertilizer N/acre in late February before spring growth begins.

## **ATTACHMENT G**

5. The allowable hydraulic loading rates based on percolation (Lw(p)) for each month was computed. Only the months during which process water would be generated were calculated (i.e. June- Nov.).

**Table A-1**  
**Design Hydraulic Loading Calculations**

	Pr	ET	Net ET	Pw	Lw(p)
	cm	cm	cm	cm	cm
June	12.8	12.50	-0.30	44.64	44.34
July	14	12.52	-1.48	43.20	41.72
August	13	11.02	-1.98	43.20	41.22
Sept.	14	8.53	-5.47	43.20	37.73
Oct.	10.4	5.28	-5.12	28.80	23.68
Nov.	10.8	2.97	-7.83	28.80	20.97
Annual Total					209.67

#### A.2. Field Area Requirements - Basis for Calculations

The design annual hydraulic loading is typically used to determine the field size. However, for this facility, the size of the field will be governed by the period of peak process water production. In July, an estimated maximum of 7,000 gallons per day (26 cubic meters) will be generated (average 4,350 gallons per day). Sizing the field based on the maximum flows in July will insure that there is more than adequate field for irrigation based on average flows during July as well as the other months.

The equation to determine the size of the field in hectares is found in *Process Design Manual for Land Treatment of Municipal Wastewater* (1981) (Pages A-5 to A-10) as follows:

$$\begin{aligned}
 \text{Area of field (ha)} &= \frac{(\text{Average daily flow m}^3/\text{d}) * (\text{days in month})}{(10,000 \text{ m}^2/\text{ha}) * (\text{monthly Lw(p) m/month})} \\
 &= \frac{(26 \text{ m}^3 * 31 \text{ d/m})}{(10,000 \text{ m}^2/\text{ha} * 0.42 \text{ m/month})} \\
 &= 0.19 \text{ ha or } 0.47 \text{ acres}
 \end{aligned}$$

For July, with an allowable monthly hydraulic loading of 0.42 meters (Table B-1), and production of 7,000 gallons per day, the spray irrigation field would require 0.47 acres.

---

ATTACHMENT A

## Calculations For Hydraulic Loading, Field Area, and Storage Requirements

## A.1. Hydraulic Loading - Basis for Calculations

Produce processing water (i.e. flume water) is usually low in macronutrients, thus the land limiting parameter is typically hydrologic loading (page 6 of OWRM Guidance Memorandum No. 93-0230, *Procedures for Processing VPA permits for the Food Processing Category*). The allowable hydraulic loading to the proposed spray irrigation field was developed using calculations found in *Process Design Manual for Land Treatment of Municipal Wastewater* (1981) (Pages A-5 to A-10). The Design Hydraulic Loading was assumed to be based on soil permeability and not nitrogen loading since process water is low in nutrients. The calculation of Design Hydraulic Loading is based on the following assumptions:

1. Design precipitation (Pr) for each month is based on a 5-year return period. This data was obtained from the *Westmoreland County Soil Survey*.
2. Estimated monthly evapotranspiration values (ET) for coastal Virginia were obtained from Blake Ross, irrigation specialist from VPI&SU, and are taken from *Agricultural Drought in Virginia, 1930-1983* (Vellidis, G., B.B. Ross, and D.B. Taylor, 1985). These rates are based on 50 years of meteorological data from Norfolk, Virginia.
3. The net ET was calculated based on the above data (Precipitation -ET).
4. The maximum design percolation rate (Pw) is based on 4% of the minimum permeability in the soil profile. Tetotum soils have the lowest permeability of the series present on-site, and thus were used for these calculations. The most restrictive layer within the soil profile for Tetotum soils has a permeability of 0.6 inch/hr (1.5 cm/hr). The maximum design monthly percolation rate requires multiplying the minimum percolation rate by 24 hours per day and the number of operational days per month.

During rainy/wet weather the field can not be irrigated, thus the system must be designed to store water during these periods and the field must be sized to allow the extra water volume to be disposed. The field will be sized to twice the daily requirement during the peak period of flow, for a total size of 1 acre. Based on hydraulic loadings, up to 14,000 gallons per day can be sprayed on the one acre field. This would equal approximately 0.5 inch per day.

### A.3 Calculation of Storage Requirements

DEQ has suggested seven days of storage for this facility. However, requiring a minimum number of days of storage does not take into account the seasonal nature of the facility nor does it reflect the variation in the quantity of wastewater produced. Longer storage may be desirable in the fall when evapotranspiration is lower and periods of rainfall more common, while less storage may be desired in the summer when water tables are at their lowest, evapotranspiration is at its highest and rainfall is less prolonged.

Since the volume of wastewater produced at this facility varies greatly over the harvest season, requirements based on days of storage can be misleading. Seven days of storage in July (31,000 gallons) is vastly different than seven days of storage in November (only 7,000 gallons). At a construction cost of approximately \$1 per gallon of storage capacity, the determination of amount of storage will have significant cost implications to this project.

VDACS is proposing approximately 20,550 gallons of storage, based on the following:

- 20,550 gallons provides between 4.7 and 20 days of storage during the harvest period.
- No more than 1 or 2 days of wastewater would be produced during periods of prolonged rain before harvesting and operations would cease, so storage requirements are minimal. The amount of produce harvested and handled at this facility is highly dependent on weather. During periods of prolonged rain (> one day) produce harvesting ceases because farm vehicles can not travel into the muddy fields and plants can be pulled out of the saturated ground if produce is picked when the ground is wet. The generation of wastewater would decrease dramatically if there are more than scattered showers over the region (i.e. Northern Neck).

- In July, the period with the shortest storage time, spraying could resume fairly quickly after rain due to the high evapotranspiration rates and low water table.
- Climatological data from tidewater Virginia indicates that there are on average 4.5 days between storm events in July, thus providing sufficient time to discharge any stored water prior to the next storm event. (Williamsburg, VA data for July, State Climatological Center).

The following chart compares the volume of storage with the projected days of storage for each month.

Storage Information			Projected Days of Storage					
Volume (gallons)	Number of Tanks	Costs	June	July	Aug.	Sept.	Oct.	Nov.
6,850	1	\$7,000	1.7	1.6	3.4	2.3	2.3	6.9
13,700	2	\$14,000	3.4	3.1	6.9	4.6	4.6	13.7
20,550	3	\$21,000	5.1	4.7	10.3	6.9	6.9	20.6
27,400	4	\$28,000	6.9	6.3	13.7	9.1	9.1	27.4
34,250	5	\$35,000	8.6	7.9	17.1	11.4	11.4	34.3
41,100	6	\$41,000	10.3	9.4	20.6	13.7	13.7	41.1
47,950	7	\$48,000	12.0	11.0	24.0	16.0	16.0	48.0

**ATTACHMENT B****Agrochemical Inventory**

An inventory was conducted of the various pesticides, and fungicides which would be potential contaminants of the produce processing wastewater. This inventory was used to identify the most common contaminant, the most toxic contaminant, those that contain heavy metals, and the seasonally variation in potential contaminants.

Six chemicals were identified which would be used on produce processed by the proposed facility. Some of these chemicals are used on all of the crops while others are restricted to a single crop (Table B-1). Each crop has a specific harvest seasons (Table B-2). July is the peak month for harvest, with four different crops being processed, while harvests in November would be limited to broccoli and greens.

**Table B-1**  
**Inventory of Chemicals Used by Crop**

Chemical	Broccoli /Green	Melons	Cucumbers	Peppers	Sweet Corn
Pounce					
Javelin					
Bravo Ultrex					
Bayleton					
Maneb					
Ridomil/Copper					

**Table B-2**  
**Inventory of Produce Harvested by Month**

Produce	June	July	Aug	Sept	Oct.	Nov.
Broc./Greens						
Melons						
Cucumbers						
Peppers						
Sweet Corn						

Based on the chemicals used on each crop and the harvest season for each crop, the periods when each chemical might be present in the process wastewater can be determined (Table B-3).

September would be the month when the greatest range of chemicals could potentially contaminate the process wastewater. However, a greater range of crops and volume of produce would be processed in July. Table B-4 indicates the total number of crops that each chemical would be used on for each month.

**Table B-3**  
**Duration of Chemicals Occurrence in Flume Water**  
**based on Harvest Period**

Chemical	June	July	Aug	Sept	Oct.	Nov.
Pounce	B,M,C	B,C,S,C,P	C,P	B,C,P	B,C	B
Javeline	B			B	B	B
Bravo Ultrex	B,M,C	M,C	C	B,C	B,C	B
Bayelton	M,C	M,C	C	C	C	
Maneb		P	P	P		
Ridomil/Copper		P	P	P		

B = Broccoli/Greens, M = Melons, C=Cucumbers, P=Peppers, SC = Sweet Corn

**Table B-4**  
**Number of Crops Per Month Using each Chemical**

Chemical	June	July	Aug	Sept.	Oct.	Nov.	
Pounce	3	4	2	3	2	1	15
Javelin	1			1	1	1	4
Bravo Ultrex	3	2	1	2	2	1	11
Bayelton	2	2	1	1	1		7
Maneb		1	1	1			3
Ridomil/Copper		1	1	1			3
No. of Crop/Chem Combinations	9	10	6	9	6	3	

***Most Common Potential Contaminant***

The most commonly used chemical will be Pounce, both in duration as well as the range of crops for which it is used. Testing should be conducted in July when there would be the greatest volume of produce being processed and the greatest range of crops being harvested which use Pounce, thus the highest potential for contamination of the process wastewater.

***Most Toxic Potential Contaminant***

The chemicals used on the crops are summarized in Table C-5 and briefly described in the following text. The Material Safety Data Sheet (MSDS) for some of the products are located in Attachment C. Additional data from the Farm Chemical Handbook (1986) is also located in Attachment C. The most potentially toxic contaminants are the active ingredient in Bayleton 50 DF (triadimefon) and the active ingredient in Ridomil (metalaxyl). These two chemical appear to be the most toxic compound potentially contaminating the wastewater, based on acute oral LD50s.

***Heavy Metals***

The process water should also be tested for manganese and copper which occur in Maneb and Ridomil/Copper, respectively.

**Table B-5  
Chemicals Potentially Used on Crops**

	EPA Reg.	Common Name	Manufacture
<b>Fungicides</b>			
Maneb		Manganese ethylene bisdithiocarbamate	Loveland Industries
Bayleton 50 DF	3125-320	Triazole Fungicide	Miles Inc.
Bravo Ultrex	50534-201	chlorothalonil	ISK Biosciences Corp.
Ridomil/Copper		Metalaxyl	Ciba Geigy Corp.
<b>Insecticides</b>			
Javelin WG	55947-136	Biological Insecticide	Sandoz Agro. Inc.
Pounce	279-3014	Synthetic Pyrethroid Insecticide	FMC Corp.

### *Brief Description of the Chemicals*

**Maneb** is a fungicide used on peppers. Manganese, a heavy metal, composes 10% of the formulation. Acute oral LD50 (rate) = 7,990 mg/kg.

**Bayleton 50 DF**, also known as Triadimefon, is a triazole fungicide used on melons, cucumbers and summer squash. The main ingredient is an organic chemical. There is also crystalline silica and several other unspecified ingredients. No heavy metals are specifically identified in the MSDS. Oral LD50 (rat) = 812 mg/kg.

**Bravo Ultrex** is granular fungicide, also known as chlorothalonil. It is used on broccoli, greens, melons, and cucumbers. No heavy metals are reported on the MSDS. Oral LD50(rat) = >10,000 mg/kg (Farm Chemical Handbook, 1986).

**Ridomil/Copper** is a fungicide used on peppers. Ridomil is also known as metalazyl. This product contains copper, a heavy metal. The Acute oral LD50(rat) = 669 mg/kg.

**Javelin** is a biological insecticide containing spores of *Bacillus thuringiensis*, a form of bacteria. This product is used on broccoli and greens to control caterpillars. Harmless to humans, animals, and useful insects. Safe for the environment (Farm Chemical Handbook, 1986)

**Pounce** is a synthetic pyrethroid insecticide used on all of the vegetables to be processed in the facility. There are four formulations of Pounce; the MSDS for each is included with the application. Because of its affinity for organic matter, there is little potential for movement in soil or entry into ground water. It is relatively easily biodegraded and has low probability for bioaccumulation. It is highly toxic to fish and aquatic arthropods.

## **ATTACHMENT H**

Northern Neck Farmer's Market VPA01422  
System Design Check December, 2008

Northern Neck Farmer's Market applies wastewater from June through November.

### Hydraulic Loading

From the 1996 application, resubmitted in 2008, the Westmoreland Co. soil survey states that the spray site has two soil series. The Rumford – Tetotum series is associated with the swale to the west and along the side slope through the middle of the field. The Kempsville Loam is located along the ridge and in the relatively flat field to the east side of the property. However, the soil borings that were performed at that time did not confirm the soil survey results. The soil borings determined that the main soils in the spray field are the Rumford – Tetotum series. For all calculations, the more restrictive Tetotum soils were assumed to be present across the entire site. They show percolation rates of 0.6 to 2.0 in/hr. This exceeds the maximum rate per hour allowable to spray (0.25 in/hr) and indicates that the soil will not be ponding water on the sprayfield.

The wetted area is 0.7 acre.

Maximum hydraulic loading per week:

$$\begin{array}{l} 3,350 \text{ gpd} \times 6 \text{ days per week} = 20,100 \text{ gallons} \quad \text{wastewater flow} \\ 4,000 \text{ gal hydrocooler} \times 3/\text{week} = 12,000 \text{ gallons} \\ 500/\text{week stormwater and cleaning} \\ \text{Total:} \quad 32,600 \text{ gallons/wk} / 0.7 \text{ a} = 46571.43 \text{ gal/a.} \\ 46571.43 \text{ gal/a.} \quad \times \quad 3.68\text{E-}05 \text{ ac-in/gal} = 1.715691 \text{ ac-in/wk} \\ \text{ok, } < 2 \text{ in/wk} \end{array}$$

### Nitrogen

$$\text{PAN in the Effluent} = 7.35 \text{ mg/l} \quad \times 0.9 = 6.615 \text{ mg/l}$$

$$\text{Wastewater flow per year} = 32,600 \text{ gal/wk} \times 26 \text{ week operating year} =$$

$$847600 \text{ gal/yr} = 0.8476 \text{ MG/yr}$$

$$0.8476 \text{ MG/yr} \times 8.34 \times 6.615 = 46.76133 \text{ pounds N/yr}$$

$$\text{Loading per acre} = \text{Pounds N/yr} / 0.7 \text{ a wetted area} =$$

$$66.8019 \text{ Pounds N/yr / a} \quad < 120 \text{ PAN limit for fescue OK}$$

95-006 Attachment B-1, Table 1 gives a PAN of 100 lb/A for fescue, Productivity Class III for non-irrigated crops. DCR and VPI have indicated that for fescue that is irrigated (with sewage effluent), soils classified as "III" or "IV" could be classified as "II," while those classified as "I" would benefit from an additional 50 lb/a of PAN for a yield of 5.0 T/A. In this example, PAN would equal 100 lb/a for Class III read from the table, increased to 120 lb/a for Class II.

**Phosphorus, Potassium, Sulfur, Salts, Carbon/Nitrogen Ratio** —G.M. 01-2005 states that for fruit and vegetable processing – flume water only—the wastes result strictly from fruit and vegetable processing. Land limiting parameters are typically hydraulic loading considerations. Macro nutrients are rarely present in significant quantities. A waiver was granted at permit issuance for TOC, BOD, percent solids, alkalinity, nitrate, ammonium, phosphorus, potassium and sodium based on this guidance. Sulfate, Sulfide, and Sulfite are shown as not believed present.

#### **Metals**

The cumulative pollutant loading rates for sewage sludge were used as a guideline. Manganese and copper could potentially be present in the effluent according to the application. A cumulative pollutant loading rate is not given for manganese. Copper was analyzed in the wastewater at a level of 0.797 mg/l on July 14, 2008

6/19/2007 0.0757 mg/l

6/20/06 0.061 mg/l

7/8/05 <0.05 mg/l

6/14/04 0.06 mg/l

6/26/03 0.194 mg/l

6/11/02 <0.04 mg/l

6/18/01 0.743 mg/l

Average 0.2526 mg/l

9VAC25-31-540. B. Pollutant limits.

TABLE 2

#### **CUMULATIVE POLLUTANT LOADING RATES**

Pollutant	Cumulative Pollutant Loading Rate	Lb/a
Arsenic	41 kg/hectare	36.57449
Cadmium	39	34.79037
Copper	1500	1338.091
Lead	300	267.6182
Mercury	17	15.16503
Nickel	420	374.6655
Selenium	100	89.20607
Zinc	2800	2497.77

If it is assumed that the same average level of copper is applied to the sprayfield each time wastewater is applied, the annual mass generation is: Avg mg/l x 8.34 x MG/yr =

1.785625 lb/Cu/yr

Ac required for land area based on copper = 0.001334 << 1 acre

Site life based on copper = 749.3683 years

**Mosca,Denise**

**From:** Rourke,Valerie  
**Sent:** Wednesday, November 05, 2008 4:39 PM  
**To:** Mosca,Denise  
**Cc:** Jenkins,Ray  
**Subject:** Land treatment permit conditions in VPA permit manual (Section V)

**Attachments:** Microsoft Equation 3.0; Microsoft Equation 3.0

Hi Denise.

I apologize that it has taken me so long to get back to you regarding the questions that you submitted. I submitted my ideas to the VPA Permit Manual Revision Committee to get their input before responding to you.

Because condition # 18 (shown below) is not applicable to land treatment, I recommended to the Committee that it be deleted and they agreed. I very hastily copied and pasted of conditions from other subsections to create Section of the VPA Permit Manual and this is likely why condition # 18 was added to subsections H and I pertaining to land application of municipal and industrial wastewater, respectively. Therefore, I will be deleting # 18 from both subsections H and I.

In place of # 18, I will be adding a new condition for wastewater land application design, installation, operation and maintenance. The new condition is similar to a condition developed for irrigation reuse of reclaimed water that is also a provision of the Water Reclamation and Reuse Regulation under 9VAC25-740-170. I recommended and the Committee agreed that if this condition applies to irrigation reuse of reclaimed water that is of comparable or better quality than wastewater to be land applied, the condition should apply to land treatment of wastewater. The condition is as follows:

18. For all land treatment of wastewater, the following shall be required:
- a. There shall be no application of wastewater to the ground when it is saturated, frozen or covered with ice or snow, and during periods of rainfall.
  - b. The chosen method of wastewater application shall minimize human contact with the wastewater.
  - c. Wastewater shall be prevented from coming into contact with drinking fountains, water coolers, or eating surfaces.
  - d. Application or irrigation systems used for land treatment of wastewater shall be designed, installed and adjusted to:
    1. Provide uniform distribution of wastewater over the land treatment site,
    2. Prevent ponding or pooling of wastewater at the land treatment site,
    3. Facilitate maintenance and harvesting of the land treatment site and precludes damage to the application or irrigation system from the use of maintenance or harvesting equipment,
    4. Prevent aerosol carry-over from the land treatment site to areas beyond the setback distances described in Part I.B. **.(Insert condition #)**, and
    5. Prevent clogging from algae or suspended solids.

- e. Any wastewater runoff shall be confined to the land application site.

For condition #19, Committee members agreed that salinity and cation imbalance were more important to monitor than pH in the soil where metals in the wastewater are not an issue. Cations, specifically Na, Ca and Mg, should be monitored in the wastewater to be applied in order to calculate the sodium adsorption ratio (SAR). Measurement of soil CEC is still needed to adjust soil pH where metals will be a problem in the applied wastewater or to calculate Exchangeable Sodium Percentage (ESP), an indicator of excessive sodium in the soil that may be resulting from salt in the wastewater applied to a site. One committee member recommended that the details of calculating SAR of the wastewater or ESP of the soil be required by a permit condition but described in the O&M Manual for the land treatment system. Another Committee member provided the following permit conditions and basis to go in the fact sheet.

#### **Permit special condition**

**##. Cation Imbalance Plan** – The permittee shall submit a plan and schedule to correct possible cation imbalances resulting from irrigation to DEQ-NVRO by December 31, 2007. The cation imbalance plan will be incorporated into the O&M manual and upon approval shall become an enforceable part of the permit.

#### **Fact Sheet**

**Cation Imbalance Plan** – A plan and schedule to correct possible cation imbalances resulting from irrigation shall be submitted to DEQ-NVRO by December 31, 2007. Upon approval, the plan and schedule shall become an enforceable part of the O&M Manual.

- a. **Measuring Salinity:** Salinity level in the effluent and soil can be determined by measuring both total sodium in ppm and conductivity in mmho/cm. The Virginia Polytechnic Institute (VPI) suggests that conductivity levels above 1.0 mmhos/cm can be detrimental to plant growth.

The best way to avoid salinity problems is to test the salt concentration of the irrigation water or electrical conductivity. Electrical conductivity is an indicator of the salt concentration based upon the ability of dissolved salts to increase the capability of water to conduct electricity.

A concentration of 640 ppm total salts normally equates to an electrical conductivity of approximately 1 mmho/cm. This is considered "clean" water and can be applied indefinitely to crops having good salt tolerance. About 15 irrigations can be applied to crops having moderate salt tolerance and about 7 irrigations can be applied to crops having poor salt tolerance. An irrigation is defined as the amount of water required to provide plant available water through a crop's most active portion of the root zone (about 1-2 inches of water).

**Table 3--Irrigation Recommendations with Water of Varying Sodium Concentrations**  
(Source, VPI)

Sodium Concentration (mg/l)	Electrical Conductivity (mmho/cm)	Good No.	Moderate No.	Poor No.
640	1	Indefinitely	15	7
1280	2	11	7	4
1920	3	7	5	2
2560	4	5	3	2

3200	5	4	2-3	1
3840	6	3	2	1
4480	7	2-3	1-2	--
5120	8	2	1	--

Crops following into each salt tolerance category include:

Good -- bermuda grass, barley, cotton;

Moderate -- rye, wheat, oats, sorghum, corn, alfalfa, tall fescue, orchardgrass, vetch, most vegetables and;

Poor -- soybean, clover, green beans, and many tree fruit crops.

This table assumes that there is no intervening rainfall of sufficient intensity to cause leaching and that there is no salt accumulation in the soil at the start of the irrigation period.

- b. Sodium Absorption Ratio (SAR): The ratio of the sodium concentration to the concentrations of calcium and magnesium in the wastewater shall be measured using SAR (Part I A.1 of the permit).

$$SAR = \frac{Na}{\sqrt{0.5(Ca + Mg)}}$$

SAR values that exceed 12 may have detrimental effects on soil structure. If the wastewater SAR value exceeds 12, the soil and/or waste may have to be treated to bring the sodium into balance with the calcium and magnesium.

- c. Exchangeable Sodium Percentage: Possible excess sodium concentrations in the soil shall be measured using ESP, the percentage of the soil's cation exchange capacity occupied by the sodium cations.

$$ESP = \frac{Na \times 100}{CEC}$$

A soil is considered to be sodic if the ESP is >15%. Soil found to have an ESP value >15% shall be treated in accordance with the approved Cation Imbalance Plan.

Although I have not yet incorporated any of the above into Section V, subsections H and I of the VPA Permit Manual, I plan to do so and you are welcome to use this in the interim if it will be of help to you. I will not be back in the office again until 11/17/08 and will be glad to answer any further questions you may have when I return.

Thanks for your patience.

Valerie

-----Original Message-----

**From:** Mosca, Denise  
**Sent:** Wednesday, October 08, 2008 9:14 AM  
**To:** Rourke, Valerie

**Cc:** Jenkins, Ray  
**Subject:** From 2008 VPA manual

On p. 55, section V, Part I, are the following conditions for the land application of industrial wastewater. I don't understand No. 18, and for No. 19, did you mean to include a liming requirement for this section? Should the condition be changed to read the land application of wastewater instead of residuals? The liming condition (with the word residuals) is listed in the municipal wastewater also.

Thanks, Denise

18. **Application Rate Limitation.** The rate of application of residuals shall not exceed 8.2(?) dry tons per acre per year.
19. **Soil pH/Liming Requirements.** All sites that have received land application of residuals will require soil pH and nutrient management. Application sites shall have soil pH and CEC measured annually with analyses of the proportional composition of exchangeable Al, Ca, Mg, K, and Na. Soils below a pH of 4.5 (s.u.) in the upper strata (0 to 8 inches) are to be limed. The liming criterion is to be based upon achieving a reduction of active acidity with a post-liming target pH in the range of 5.0 to 5.5. Soil pH amendments are to be applied in the spring or early summer so to coincide with the period of most active growth. Post-liming soil samples shall be taken immediately following the growing season and will indicate if phosphorus or other amendments are required. The annual report shall detail soil pH and other soil amendment management (type and quantities of chemical amendments) on a field by field basis so to demonstrate compliance with soil pH and nutrient management design.

Denise Mosca  
Environmental Specialist II  
DEQ-Piedmont Regional Office  
4949-A Cox Road,  
Glen Allen, Va. 23060  
(804) 527-5027  
fax (804) 527-5106

Information from DEQ - VRO concerning PAN requirements for  
irrigated crops

VPA Permit Fact Sheet Attachment 4  
Permit No. VPA09000

VPA01432

Rationale for PAN Loading Rates:

The Soil Productivity Groupings for the soils associated with the spray sites are as follows:

<u>SOIL</u>	<u>GRASS-LEGUME HAY YIELD*</u>	<u>PRODUCTIVITY CLASSIFICATION**</u>	<u>PAN REQUIREMENT**</u>
Ashe - AsC	3.0 T/A	3	150 lb/A
AvD	<2.5 T/A	4-	<125 lb/A
Braddock - BcB	5.0 T/A	1+	200 lb/A
Buckhall - BuC	3.0 T/A	3	150 lb/A
Elloak - ElB	5.0 T/A	1+	200 lb/A
ElC	4.5 T/A	1+	200 lb/A
EnC3	3.0 T/A	3	150 lb/A
Meadowville - MvB	4.5 T/A	1+	200 lb/A

\* from Soil Survey of River Bottom County, Virginia

\*\* from 6/92 VPA Permit Manual

The above production figures are for non-irrigated cropping systems, in which water is frequently a limiting parameter. To estimate potential hay yields on the same soils under irrigation (with the STP effluent), Russ Perkinson (Va. Dept. of Conservation and Recreation) and Dr. Steve Donohue (Dept. of Crop and Soil Env. Sciences, VPI & SU) were consulted via telephone on 8/3/93.

Mr. Perkinson and Dr. Donohue agreed that Kentucky 31 Tall Fescue hay production would be increased significantly with irrigation. Under those conditions, soils classified as "3" or "4" (in the above scheme) could be reclassified as "2", while those classified as "1" would benefit from an additional 50 lb/A of PAN for a yield of 5.0+ T/A.

Each of the above soils was upgraded in response to those comments; the soil types and relative percentage of each comprising each of the 11 individual spray subsite were then determined (following page). Based its constituent soils, each subsite was then assigned both an expected hay yield and PAN requirement as follows:

<u>SUBSITE</u>	<u>ASSIGNED</u>	
	<u>HAY YIELD(T/A)</u>	<u>PAN(lb/A)</u>
I	4.0	200
II	4.0	200
III	5.0+	250
IV	4.0	200
V	4.0	200
VI	4.0	200
VII	4.0	200
VIII	5.0+	250
IX	5.0+	250
X	4.0	200
XI	4.0	200

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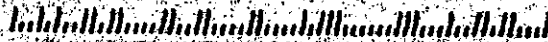
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Dept. of Environmental Quality  
Piedmont Regional Office  
4949-A Cox Road  
GLEN ALLEN, VA 23060-6296

ATTN: DENISE MOSCA OR  
K.M. OWENS

76201



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1. Article Addressed to:

Mr. Rod Parker  
Northern Neck Farmers Market  
1647 Kings Highway  
COLONIAL BEACH VA 22520

RE: REISSUANCE OF VPA PERMIT  
No. VPA 01422, DATED  
JUNE 2, 2009

COMPLETE THIS SECTION ON DELIVERY

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*M. A. Hopkins*

☒ Agent  
☒ Addressee

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M.A. Hopkins

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6/4/09

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☐ Yes

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Lake Packing Company DMM  
System Design Check  
Page 2

### Phosphorus

Per the SCS in the previous application, bermudagrass will utilize 100 lb. Per acre per year as P<sub>2</sub>O<sub>5</sub>. The application shows that there is adequate land to take up all the phosphorous applied. However, P is continued to be tracked because of the commercial fertilizer applied in addition to the wastewater.

### Potassium

The application shows that too much potassium is being applied (1996 numbers) according to the system design. However, potassium, for which there is no groundwater standard, was substituted in the tomato process for sodium. Because of the application of sodium, groundwater limits have been exceeded. Under consent order with DEQ, Lake Packing has shown that the direction of the groundwater flow is of the peninsula, toward the Coan River, and no shallow water wells have been impacted. Therefore, the substitution of the potassium for the sodium in the process is seen as an improvement. The current DCR Nutrient Management Handbook states that potassium contamination of surface and groundwater is not considered a major environmental problem. The old VPA Tech manual from the Water Control Board gives a level of 250 -340 mg/l K as a taste threshold. The most current sampling values from 1997 show 63.5 mg/l K at MW-1, 1.79 mg/l at MW-2, and 4.1 mg/l at MW-3. Potassium will be added to the groundwater parameters to track this.

### Sulfur

Applicant calculated 0.133 lb/A is being applied. Per the SWCB VPA Tech manual, Bermudagrass Hay will uptake S at the rate of 40-50 lb/A. Groundwater Criteria for the Coastal Plain is 50 mg/l: Sulfate is not monitored in the GW According to the applicant, 0.002 tons were applied in the highest year (1996). 4 lb/30 A. = 0.133 lb/A. Sulfate was removed from roe and clam as a monitoring parameter because it is not expected to be a problem.

### Salts

Per the SWCB VPA Tech manual, a maximum allowable SAR of 8-12 should be required for all wastes. The applicant calculated a SAR of 5.72. Applied in 1996 (highest year)

Na 154 mg/l

Ca 15.7 mg/l

Mg 23.5mg/l SAR =  $\frac{[(154 \text{ mg/l}/23 \text{ mg/meq}) + ((15.7 \text{ mg/l}/20 \text{ mg/meq}) + (23.5 \text{ mg/l}/12 \text{ mg/meq}))^2]^{1/2}}{2}$   
= 5.72

### Carbon/Nitrogen Ratio

Per the SWCB VPA Tech manual, this ratio is of interest because immobilization may be the cause of nitrogen not being available to the plants in the short term until the N is released through mineralization. Wastes with a high carbon to nitrogen ratio (C:N >23) produce this immobilization. COD has only been tested in the hominy wastewater, at 102 mg/l. With a TKN of 1.15 mg/l for the same wastewater, it would seem that this problem would apply at least to the hominy wastewater, but it has never produced an observable effect on the bermudagrass field.

Lake Packing Company DMM  
System Design Check  
Page 3

**Metals** Ni, Cu, Zn, Pb, Co, Cd, other

From the EPA Process Design Manual for Land Treatment of Municipal Wastewater, Table 4-5 gives values for suggested maximum applications of trace elements to soils without further investigation. The values are given in kg/ha, and are converted to lb/yr through division by 1.12. The SWCB VPA Tech manual's Table 5.7 gives recommended Limits for Metals Allowed on Agricultural Land, varying with Soil CEC. Lake Packing's old application gave a CEC of less than 5.

Element	EPA Kg/ha	lb/a	SWCB VPA lb/a Tech Manual CEC<5	Lake Packing Values Application, lb/ac
Ni	184	164	125	2.08
Cu	184	164	125	4.16
Zn	1840	1643	250	13.74
Pb	4570	4080	500	2.08
Co	46	41	no value	No anal.
Cd	9	8	0.45 annually	0.208

**Metals Site Life Calculations** Total Allowable/avg rate per year SWCB maximums used.

Element		
Ni	60.1 years	Because the time frames for Copper and Zinc approach
Cu	30.0	realistic time frames for use of the sprayfield, the appl.
Zn	18.2	should be tracked in the O&M manual
Pb	240.4	
Cd	38.6 (used EPA maximum)	

**CEC** Will be required by permit special condition for updated analysis and calculation

**Anions** As, B, Cl

Bermudagrass was selected as a crop because it is among the most tolerant to salt.

(EPA Table 9.4). Lake Packing calculates that as per their highest recent year production 199 lb/yr chlorides were applied. In the May, 1999 groundwater sampling event, the monitoring wells produced the following results: MW-3 28 mg/l, T-8 35 mg/l, T-6 41 mg/l. The groundwater criteria for chloride is 50 mg/l.

The SWCB VPA Tech manual suggests evaluation of needed area (sq. meters) for chloride waste through the leaching equation:  $[(C_i - C_d)/D_r(C_d(1-\alpha) - C_r)] \times 100 Q$ , where  $C_i$  is concentration of the mobile species in the waste (mg/l),  $C_d$  is the allowable drinking water concentration of the mobile species (mg/l),  $D_r$  is the rainfall input, cm/yr,  $\alpha$  is the ratio of evaporative losses to rainfall as determined by geotechnical data and the vegetation, Alpha values will normally lie within the range of 0.65 to 0.80.  $Q$  is WW volume, cubic M/yr  $C_r$  is the concentration of the mobile constituent in the rainfall, mg/l (assumed to be zero).

Chloride (mg/l) adjusted for relative flow: (Cl in roe WW assumed 178 mg/l since [Na] similar to tomato, also used for vegetable and clam, fishbait and oyster shell wash)

$$178(2.1)+178(.009)+20(.122)+178(.34)+178(2.1)+178(3.06)+178(0.527)/2.1+.009+0.122+.34+2.1+3.06+.527=C_i$$

$$C_i \text{ adjusted for rel.flows} = 175.6658$$

$C_d$  is the groundwater criteria of 50 mg/l

$$D_r \text{ is } 42.66 \text{ in} \times 2.54 \text{ cm/in} = 108.4$$

Alpha is used as 0.65 for conservativeness

$$Q \text{ is } 2.1+.009+0.122+0.34+2.1+3.06+.527 \text{ MG} =$$

$$8.258 \text{ MG} \times (0.003785 \text{ cubic meter/gal}) \times 1,000,000 \text{ gal/MG} = 31256.53 \text{ cubic meters}$$

Lake Packing Company DMM  
System Design Check  
Page 4

$$A = \frac{((176 - 50) / (((108.4) * 50 * (1 - 0.65) - 0))) * 100}{31256.53}$$

207607.9 sq. meters

= acres = 51.29992 which EXCEEDS the 30 acres available

Lake Packing will be required to monitor chloride for each process for more accurate values and repeat this calculation each year in the annual report

Arsenate is listed in the application tomato wastewater characterization as less than detection.

Boron is assumed present, but no test value is given. A special condition in the VPA will require analysis of this and any other parameter which is assumed present and not analyzed.

Process	Nitrogen Concentration, mg/l	Yearly Flows from Application Wastewater Characterization (M
Tomato	143.5	2.1
Corn and Fresh Vegetables	1.9	0.34
Hominy	1.77	0.122
Herring Roe	206	0.009
Clam	109	2.1
Fish Grinding	206 (used herring value)	3.06
Oyster Shell Washwater	109 (used clam value)	0.527

## Lake Packing Company DMM System Design check

Lake Packing applies the wastewater according to the schedule: Tomatoes: August-Sept, Herring Roe: April- May, Sweet Corn: June-July-August, Fresh Vegetables: May-Oct. Fish grinding for bait: main production May-Oct some production Nov-April. Empty Oyster shell wash: May-Oct. Hominy wastewater is most often discharged in accordance with VPDES permit, but may be sprayed inbetween other products. Only one product runs per day.

Sample results used (from application) were chosen when operating at full capacity and should represent worst case loadings. Business has fallen off in recent years.

### Hydraulic Loading

From Exhibit 20 in the application, the most restrictive layers in the soils, Dragston, Woodston and Sassafra Soil, show percolation rates of 1/5 in. to 2 in/hr. This exceeds the maximum rate per hour allowable to spray, 0.25 in/hr and indicates that the soil will not be ponding water on the sprayfield.

**Nitrogen** see page 4 for table of concentrations and flows

Lw(n)=Wastewater hydraulic loading rate based on nitrogen limits, in/yr

Cp = percolate nitrogen concentration mg/l = 5 mg/l nitrate groundwater standard

Pr = precipitation rate, in/yr = 42.66 from appl.

ET = evapotranspiration rate in/yr= 38in/yr from SCS from prev. appl.

U = crop nitrogen uptake rate, lb/acre-yr = 350 lb/Ac for bermudagrass

f = fraction of applied nitrogen removed by volatilization, denitrification, and storage = 0.15 (EPA)

Cn = nitrogen concentration in applied wastewater, mg/l: 143.5 mg/l tomato, 206 herring roe, 1.77 mg/l hominy, 1.9 mg/l corn/vegetables, 109 mg/l for clam, 206 mg/l fish bait (used herring value), 109 mg/l oyster (used clam value)

$$143.5(2.1)+206(.009)+1.77(.122)+1.9(.34)+109(2.1)+206(3.06)+109(.527) / (2.1+.009+0.122+.34+2.1+3.26+.527) =$$

$$N \text{ adjusted for relative flows} = 147.8286 \text{ mg/l}$$

$$Lw(n) = [Cp (Pr-ET) + 10U] / (1-f)(Cn-Cp)$$

$$Lw(n) = [5(42.66-38) + 10*350] / (1-0.15)(147-5) = 52.3 \text{ in/yr}$$

$$52 \text{ in/yr} \times \text{operating yr/26 wk} = 2.01 \text{ in/wk}$$

**OK--2 in/wk max is the permit manual hydraulic recommendation**

However, Lake Packing's previous permits (NDC and VPA) contained a 3 in/wk max and no problems have been observed.

$$Ln \text{ Allowable N Loading lb/ac/yr} = U + D + V + \{(2.7)[Lw+(P-E)(Cd)]\}$$

U = crop uptake lb/ac = 350

D = denitrification

V = volatilization = 0.15 for both D+V

Lw = hydraulic loading ft/yr

$$Lw \text{ ft/yr} = \text{MG/yr} \times 1,000,000 \text{ gal/MG} \times .00003684 \text{ ac-in/gal} \times 1/30 \text{ acres} \times \text{ft/12 in} =$$

$$P = \text{precipitation ft/yr} = 121.6899$$

$$E = \text{Evapotranspiration ft/yr} \quad Q \text{ MG/yr} = 2.1 \text{ MG/yr tomato, .009 MG/yr roe, .122 MG/yr hominy,}$$

$$Cd = \text{percolate N conc. Mg/l} = 0.34 \text{ MG/yr veg and corn, 2.1 MG/yr clam}$$

$$\text{conversion factor } 2.7 = 3.06 \text{ MG/yr fish bait, 0.527 MG/yr oyster shell wash}$$

$$Ln = 350 + (0.15) + \{(2.7)[122 + (42.66-38)(5)]\} =$$

$$741.6227 \text{ allowable N loading lb/ac/yr}$$

OK--this amount exceeds 350 lb/ac/yr, permitted amount of N

## A. MONITORING REQUIREMENTS

9. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmer's Market and the land application site listed in Attachment A.
10. The pollutants shall be monitored by the permittee as specified below:

GROUNDWATER MONITORING

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>UNITS</u>	<u>MONITORING REQUIREMENTS</u>	
			<u>Frequency</u>	<u>Sample Type</u>
TOC TDS				
Static Water Level	NL	ft	2/Year	Measure
Chloride	NL	mg/l	2/Year	Grab
Conductivity	NL	umhos/cm	2/Year	Grab
Nitrate-Nitrogen	NL	mg/l	2/Year	Grab
Nitrite-Nitrogen	NL	mg/l	2/Year	Grab
pH	NL	Standard Units	2/Year	Grab
Sulfate	NL	mg/l	2/Year	Grab
Mercury	NL	ug/l	2/Year	Grab
TKN				

NL = No Limit, this is a monitoring requirement only

- 11 3. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Groundwater Monitoring Well Numbers MW-1, MW-2, and MW-3. (Refer to Attachment A).
- 12 A. The wells shall be properly purged prior to sampling each monitoring well.

A. MONITORING REQUIREMENTS

- During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmer's Market and the land application site listed in Attachment A.
- The pollutants shall be monitored by the permittee as specified below:

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>WASTEWATER MONITORING</u>		<u>MONITORING REQUIREMENTS</u>	
		<u>UNITS</u>	<u>Frequency</u>	<u>Sample Type</u>	
Flow (MG)	NL	MG	Monthly	Estimate	
Application Rate	0.25	in/hr	Monthly	Calculate	
Application Rate	1.0	in/day	Monthly	Calculate	
Application Rate	2.0	in/wk	Monthly	Calculate	
pH	NL	Standard Units	1/Year	Grab	
Total Kjeldahl Nitrogen (TKN)	NL	mg/l	1/Year	Composite*	
Nitrate-Nitrite-Nitrogen (NOx)	NL	mg/l	1/Year	Composite	
PAN**	NL	mg/l	1/Year	Calculate	
Pounce <sup>1</sup>	NL	ug/l	1/Year	Composite	
Metaxly (Ridomil/Copper) <sup>2</sup>	NL	ug/l	1/Year	Composite	
Triadimefon (Bayleton 50DF) <sup>2</sup>	NL	ug/l	1/Year	Composite	
Copper	NL	ug/l	1/Year	Composite	
Manganese	NL	ug/l	1/Year	Composite	

NL = No Limit, this is a monitoring requirement only

<sup>1</sup> Identified by the applicant in the application dated August 11, 1008 as the most commonly used agrochemical that may appear in the wastewater.

<sup>2</sup> Identified by the applicant in the application dated August 11, 1008 as one of the more toxic agrochemicals that may appear in the wastewater.

- Samples taken in compliance with the monitoring requirements specified above shall be taken in July each year at the following locations:  
Wastewater samples to be taken in accordance with the locations and procedures outlined in the approved O&M Manual (see special condition No. 3).

- Refer to Attachment A for field productivity classifications and Attachment B for PAN limitations.

\* A representative composite sample shall be comprised of at least four volume average or weight average grab samples composited over a daily operating period.

\*\* Plant Available Nitrogen. This consists of the addition of the nitrogen parameters of TKN and Nitrate-nitrite.

A. MONITORING REQUIREMENTS

5. During the period beginning with the permit's effective date and lasting until the permit's expiration date, the permittee is authorized to manage pollutants at the Northern Neck Farmer's Market and the land application site listed in Attachment A.
6. The pollutants shall be monitored by the permittee as specified below:

SOILS MONITORING

<u>PARAMETERS</u>	<u>LIMITATIONS</u>	<u>UNITS</u>	<u>MONITORING REQUIREMENTS</u>	
			<u>Frequency</u>	<u>Sample Type</u>
pH	NL	Standard Units	1/Year	Composite
Cation Exchange Capacity	NL	MEQ/100g	1/Year	Composite
Available Phosphorus	NL	mg/kg	1/Year	Composite
Exchangeable Potassium	NL	mg/kg	1/Year	Composite
Hydraulic Conductivity	NL	in/hr	1/Year	Composite

NL = No Limit, this is a monitoring requirement only

7. Samples taken in compliance with the monitoring requirements specified above shall be taken in October of each year at the following locations: soil samples to be taken in accordance with the locations and procedures outlined in the approved O&M Manual (see Special Condition No. 3).
8. Soil composite samples shall be representative of the soil types delineated by the SCS Soil Survey (or the equivalent). Samples shall be taken at 0-6 inches soil depth for each application site.

MEMORANDUM

DEPARTMENT OF ENVIRONMENTAL QUALITY  
Piedmont Regional Office

4949-A Cox Road, Glen Allen, VA 23060

804/527-5020

SUBJECT: Reissuance of VPA Permit No. VPA01422  
Northern Neck Farmers Market – Westmoreland County, Virginia

TO: C. J. Linderman, P.E., Water Permit Manager

FROM: Denise M. Mosca, Permit Writer

DATE: June 2, 2009

COPIES: PRO-OWPP

Legal Name of Owner: Northern Neck Vegetable Grower's Association

Application Submitted By: Rod Parker, Manager

Application Date: Initial application was submitted on June 24, 2008. Date of complete application: December 22, 2008.

Permit Fee: Northern Neck Farmers Market was not included on the latest FY09-Water-AMF-Past Due spreadsheet as of 11-13-08 as not being current with permit fees.

Type of Discharge: The facility spray seasonally irrigates a maximum of 7,000 gallons per day of industrial wastewater generated during fruit and vegetable processing – flume water only. The wastewater also contains 400 gallons per week of rainwater that blows into the facility structure and 100 gallons per week of equipment cleaning wash water with no detergents or other soaps. In the winter after the facility has shut down for the season and all the equipment has been cleaned, the contents of the settling tank is emptied into the storage tanks. At that time, when there may be no subsequent commingling of process wastewater and storm water, the valve on the settling tank is opened so that rainwater that collects is drained into the marsh.

Wastewater Treatment Settling.

CONCURRENCES

SYMBOL	PRO	PRO						
SURNAME	Mosca	Cohen						
DATE	6-2-09	6-2-09						

<u>Public Notice:</u>	The application and draft permit have received public notice in accordance with the Permit Regulation and comments were received from Mr. Parker protesting the groundwater monitoring frequency. As a result of public comment from the owner, an addition to the above condition was made. After 12 datapoints of groundwater data are collected subsequent to the corrective action, if no significant difference is seen from the upgradient well, after written notification from DEQ, the groundwater monitoring frequency may drop from 1/Quarter to 1/6 months. This does not represent a backsliding issue as the monitoring frequency in the 1998 permit is 1/6 months.
<u>Planning:</u>	Not Applicable.
<u>EPA Comments:</u>	EPA has waived the right to review the subject draft permit.
<u>VDH Comments:</u>	The application was sent to the VDH-ECFO on October 23, 2008 and a response that there are no known or potential sources of contamination within 50 ft. of the groundwater well/regulated public drinking water system was received on October 31, 2008. They did not object to the permit.
<u>Previous Board Action:</u>	None
<u>Staff Comments:</u>	<p>The discharge is not controversial.</p> <p>The permit expired June 30, 2008, and an initial application was received on June 24, 2008. The permit exceeded 120 days of a complete application because the Westmoreland News only published the public notice once instead of twice. It was caught and the public notice ran again twice in the Westmoreland News, but this extended the notice period.</p> <p>The staff believes that the attached monitoring requirements will maintain the Water Quality Standards adopted by the Board.</p>
<u>Basis for Monitoring:</u>	VPA Permit Manual
<u>Licensed Operator Requirements:</u>	None

STAFF RECOMMENDATIONS:

The staff recommends that:

1. The attached effluent limitations and monitoring requirements be approved.
2. VPA Permit No. VPA01422 be reissued.

APPROVED:

  
Water Permit Manager

DATE:

4/2/09

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